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EDITORIAL.

Agriculture in Kelantan.

From time to time, articles have appeared in this Journal describing agricultural conditions in certain defined areas in Malaya. These articles have followed the establishment of a Department of Agriculture within the area described, or have been written by visiting officers of the Department of Agriculture who have been requested to report on local conditions with a view to the establishment of agricultural services.

Agricultural services in Kelantan were inaugurated at the end of 1930 when Mr. J. A. Craig was seconded from the Department of Agriculture, Straits Settlements and Federated Malay States, to the post of Principal Agricultural Officer, Kelantan. A record of the work performed in Kelantan since the inception of the Department may be found in various official reports, but at our request Mr. Craig records in an article included in the present number additional information of a general and descriptive nature dealing with the agricultural conditions obtaining in that State. The article is of particular interest, for not only is Kelantan less known to the majority of our readers than are most other States, but conditions in this area differ materially from those pertaining to the south and west of the Malay Peninsula.

Kelantan, with 5,700 square miles, is the fourth largest State in Malaya. Its total population is 360,000, of whom 327,000 are Malays. The importance of agriculture is evinced by the fact that 128,000 persons are engaged in agriculture of whom 109,000 are rice planters.

Rice cultivation is of first importance with over 148,000 acres planted, while rubber with 75,000 acres is of second importance. There are a number of other crops cultivated which contribute materially to the well-being of the inhabitants, but most of which are capable of enhanced returns. The development of agricultural services is of importance as it will not only result in greater prosperity to the inhabitants of that State by such means as improvements in methods of cultivation, provision of better planting material, and in improved marketing conditions, but the greater prosperity will reflect favourably on the rest of Malaya by increased agricultural trade between States and by rendering Malaya less dependent on imported foodstuffs and other agricultural products.

Refining of Palm Oil.

The separation of palm oil from water, sludge and impurities, which is part of the factory procedure on estates, is efficiently carried out, but the fact that it is a discontinuous process points to the desirability of devising machinery and a system which will eliminate delay and prove more economical than the present method. Dr. T. A. Buckley and Mr. J. L. Greig describe, in an article on another page, an investigation of the operation of machinery designed to effect continuous refining of palm oil. Palm oil factory managers will find this article particularly instructive, for the authors not only give details of the actual procedure to be followed, but, by recounting the steps in their investigation, shew how pitfalls may be avoided by closely following the technique which they have found produces satisfactory results.

The Twelfth Malayan Exhibition.

The speech of Sir Shenton Thomas at the opening of the Malayan Exhibition was largely a review of the progress of Malayan agriculture during the past year, and for this reason was a fitting introduction to the Exhibition. His Excellency's speech is included in this number and we propose to publish an account of the Exhibition next month.

Particularly during the past few years, bodies such as the Department of Agriculture, the Co-operative Department and the Rubber Research Institute of Malaya, have devoted much attention to the problem of improving the quality of agricultural produce, and in the task of making known to the producer the methods to achieve this end, the Malayan Agri-Horticultural Association has ably supported the policy of these Departments. A noticeable feature of the Exhibition this year was that manufacturers of machinery appear to have appreciated the importance of the smaller landowners as potential buyers of factory machinery. In broad terms, it may now be asserted that suitable factory equipment is available to meet the needs of large estates or of small holdings. In so far as the important crops are concerned, it is possible for the small-holder to prepare for market a product equal to that from the large estate.

At the request of Government, the Association this year drew special attention to the coconut industry by staging a most comprehensive series of exhibits in a special Coconut Section. We consider that this section was the most outstanding success of the Exhibition. The large crowd of visitors was evidence that the public were interested, and we have no doubt that the Section, by making more widely known the many uses to which the produce of the coconut palm may be put, has achieved valuable propaganda for the coconut-planting industry.

Original Articles.

CONTINUOUS REFINING OF PALM OIL

BY
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Methods Employed on Estates in Malaya.

In the manufacture of palm oil in Malaya, the digested fruit is treated in centrifugal extractors or presses, from which a mixture of oil and water together with a small proportion of fibrous and cellular matter is expelled. The next stage in the process is to pump the mixture into tanks, where it is heated with live steam for 2 hours and then allowed to settle for 16 hours. In the press system of manufacture, more water has to be added before heating, but in the centrifugal system the amount of water in the mixture, rather less than one third, suffices. After settling, the oil and water layers are found to be separated except for a small intermediate layer of sludge which is afterwards again heated. The oil layer is drawn off, strained through metal gauze, and heated again before passing through a centrifugal purifier. A very small amount of water or emulsion has to be discharged by the machine and a black sludge is deposited in the bowl. The oil so refined is ready for export, and contains only about 0.2 per cent. of moisture and a trace of dirt.

The refining of crude oil, as briefly outlined above, involves losses of under 0.5 per cent. and may be said to be satisfactory in operation, in efficiency and in purity of product. Nevertheless, boiling and settling is a discontinuous process, consuming space, time and heat, and achieving only partial purification of the oil; therefore its elimination, if economical and efficient, would mark an advance in manufacture There are no grounds, however, as far as experience shows, for supposing that the process is detrimental to the oil.

Description of Plant effecting continuous Refining.

A plant designed to eliminate the boiling and settling process, and make extraction and refining continuous, is manufactured by Messrs. Titan Ltd., Copenhagen, and called the Titan Sludge Separator. These separators are not designed specially for palm oil nor for oils alone, and are centrifugal machines with the novel capability of separating two liquids and discharging any solid suspended matter intermittently while still running at full speed.

The bowl of the machine, which rotates at the high normal speed of 6,300 r.p.m., consists of two relatively telescopic sliding parts between which a peripheral discharge slot is opened in one position. The movable part of the

bowl is ordinarily retained by springs so that the slot is closed, but by admission of water into a special chamber in the bowl a hydrostatic pressure is generated which overcomes the pressure of the springs and opens the slot. The contents of the bowl are ejected into a casing, after which the water generating the pressure escapes and the slot is closed again.

After discharging the bowl, or when first starting, a quantity of water is introduced before opening the feed pipe. This occupies the peripheral zone to the limit of the separating plate, so that more water entering with the feed escapes behind the plate and the oil, that is, the lighter component, is diverted. Solids, actually a thick sludge in the case of palm oil, accumulate at the periphery and are periodically discharged after interrupting the feed.

The scheme is roughly, therefore, that the crude palm oil from the extractors is merely strained free from fibre, pumped into an overhead tank, and fed hot to the separator which delivers refined oil directly. The sludge accummulating from periodical discharge of the bowl is set aside to settle and the oil is recovered.

Arrangements for Testing the Process by the Department of Agriculture.

The local agents for Messrs. Titan Ltd., Messrs. Hindhede & Co. Ltd., Singapore, being desirous of putting the Titan Separator to practical test with palm oil, approached the Department of Agriculture, and finally made an agreement to instal temporarily a plant with necessary fittings in the palm oil factory at the Central Experiment Station, Serdang, so that it might be worked by the staff of the Department.

The equipment erected in the factory was as follows:—

1. Titan Separator, N.S. 66 fitted with fast and loose pulleys of such size as to give the requisite speed when driven by a belt from an existing shaft.
2. Hand pump to force water into separator for discharging sludge.
3. Contact emulsifier, for mixing oil and water, heating with steam, and delivering to the machine.
4. Overhead storage tank for delivering oil by gravity to the contact emulsifier.

Messrs. Titan Ltd. manufacture a rotary strainer which performs the essential function of removing fibre and coarse solids which would clog the machine, but did not supply one; consequently, sieves of metal gauze were improvised with most unsatisfactory results.

The contact emulsifier is merely a vertical cylinder into the bottom of which oil from the supply tank, water from the factory supply pipes, and steam, may be admitted. At the top is a thermometer showing the temperature at which the mixture is fed to the machine.

Results of Trials at Serdang.

When all parts were correctly assembled and trials commenced, a succession of troubles was experienced, some accidental and easily overcome. Among the latter were a failure of water supply owing to its being by-passed by the boiler feed, and a failure of the bowl to open and discharge, owing to dirt in the water supply choking a gauze strainer in the inlet to the bowl. In view of the fact that very little water is used for discharge of the bowl, pure water was supplied from a kerosene tin instead of relying on the factory supply.

Much trouble was caused by blockage of the cocks by fibre, because the strainers were not working effectively. Any metal gauze strainer becomes rapidly covered by a mat of fibre, causing the liquid to overflow. A succession of strainers was improvised, of increasingly fine mesh, which eventually served successfully to prevent fibre from entering the storage tank. Nevertheless, it was obvious that the process could not be worked continuously without strainers providing for the regular scraping of the straining surfaces by mechanical means.

The contact emulsifier was a constant source of trouble. The quantities of oil and water entering cannot be seen but must be adjusted blindly by the respective cocks, while the effect of any adjustment on the liquid delivered is not immediately apparent. For the best conditions of separation, the mixture is required to be heated to a temperature of 90 to 100°C. by steam admitted to the emulsifier, but this temperature was rarely attained. The steam created a back pressure in the emulsifier, frequently entirely preventing the entry of oil and at all times causing fluctuations in the rate of delivery of liquid. Consequently, even though the emulsifier was left untouched, the flow of liquid into the centrifuge varied continuously, sometimes ceasing altogether for several seconds, sometimes becoming very rapid.

The feed was variable for another reason; when the mixture of crude oil and water from the extractors is placed in a storage tank, a few minutes suffice for a layer of water to settle containing very little oil. If this is allowed to run to waste, the admixed oil is lost, whereas if it is fed to the separator a long time elapses before an appreciable amount of oil is recovered. Subsequently, there is a sudden change to a liquid mainly composed of oil, and water has then to be admitted to the emulsifier.

In any case, there is extreme variation in the composition and quantity of liquid being fed to the separator. The bowl of the separator is provided with interchangeable sets of hollow screws, which penetrate to different distances into the annular chamber into which the separated water is driven, the water being discharged through these screws into the appropriate cover. The length of screw controls the separation and must be suited to the composition of the mixture to be separated. Long screws yield a water discharge with the minimum of oil, and short screws allow a little oil to escape separation. Hence,

good results cannot possibly be expected with a variable feed, for the screws can only be altered before starting. Messrs. Titan recommend the use of two separators in series, one to yield oil containing a little water, and the other to complete the separation, but such a suggestion is not likely to appeal strongly to users.

The first trials were made with short regulating screws in position; that is, an adjustment tending to allow a little oil to be lost in the water discharge even under the best conditions, but one that should yield an oil containing a minimum of moisture. In most cases, the water layer from the supply tank was allowed to run to waste, before commencing to feed the emulsifier. The feed to the centrifuge fluctuated in the manner already described, as did also the temperature, which rarely reached the optimum height.

During one of the most favourable spells, samples of oil were taken at intervals and combined in a bottle, samples also being taken of the water discharge. Samples of sludge were taken on two occasions when the bowl was discharged. The freshly discharged oil was cloudy on account of entrained air, but quickly cleared. The water discharge was milky on account of emulsified oil. The freshly discharged sludge contained brown semi-solid masses of emulsion, which on standing, separated with surprising rapidity into oil and watery sludge. The samples were analysed with the following results :—

Palm oil			
Moisture	...	0.39	per cent.
Dirt	...	0.005	,,
Water discharge			
Oil	...	1.03	per cent.
Suspended solid	...	2.37	,,
Sludge No. 1			
Water	...	27.5	per cent.
Oil	...	64.4	,,
Suspended solid	...	8.1	,,
Sludge No. 2			
Water	...	38.8	per cent.
Oil	...	58.7	,,
Suspended solid	...	2.5	,,

Thus, while the oil was adequately freed from dirt, it retained twice as much moisture as is normal in ordinary estate output. The loss of oil is not large expressed as a percentage of the water, but the volume of water discharged must be taken into consideration.

At a later trial, the relative output of oil, water and sludge was measured, although on this occasion the machine behaved less satisfactorily. The feed was slow and frequently interrupted, the temperature rarely exceed 70°C., and yellow clots of emulsion constantly escaped with the water discharge. In a period of nearly two hours there were obtained :—

Oil	...	193 lbs.
Water	...	55 gallons
Sludge	...	14 „

The composition of these was as follows:—

Oil

Moisture	...	0.33 per cent.
Dirt	...	0.003 „

Water

Oil	...	3.9 per cent.
Solids	...	0.7 „

Sludge

Water	...	52.2 per cent.
Oil	...	47.5 „
Solids	...	0.3 „

The low proportion of solids in the sludge is explained by the fact that the lower layer of water from the supply tank was run to waste. Obviously, frequent discharge of the bowl, every 10 minutes as recommended, was unnecessary. For some reason, a larger amount of dirt escaped with the water than remained in the bowl. The condition of the oil was as before, but the high oil content (*viz*: 21½ lbs.) of the water discharge represents a serious loss.

It was sought to reduce this loss by restricting the amount of water admitted to the emulsifier and thereby also raising the temperature of the mixture. The result, while working with short regulating screws, was to render the water-seal of the bowl very unstable, and on three occasions following a spurt of mixture containing only a small proportion of water, the seal broke and oil began to discharge from the water outlet.

A change in procedure was then made. An open steam pipe was fixed in the supply tank for the purpose of heating and stirring the mixture. In the bowl, long regulating screws were fitted. The steam pipe did not fulfil its function satisfactorily, consequently, the usual fluctuations in volume and composition of the mixture supplied by the emulsifier occurred. The effect of the long screws was marked; the water discharge was almost transparent while the oil was turbid from moisture. Sometimes, even, quantities of clear water emerged with the oil, this being, apparently, dependent on the feed. So long as a steady and considerable proportion of water was contained in the entering mixture, the oil passed out reasonably water-free. After a time, the machine was stopped, and the long regulating screws replaced by the next shorter size, but on resuming no benefit was noticeable.

At the suggestion of Mr. Hindhede who witnessed the trial, the oil so far delivered containing a little water was put through the machine again, after fitting the shortest regulating screws. As a result, the oil was delivered

containing only 0.14 per cent. of moisture which is quite satisfactory. This procedure is, of course, equivalent to using two machines.

Results of Modified Procedure.

Since by observation it appeared that, unless working with the shortest screws, success depends on the presence of a regular and adequate proportion of water in the mixture, the open steam pipe in the supply tank was readjusted so as to produce the maximum agitation of the mixture at the same time as heating it. The second longest regulating screws were fitted, and the mixture passed through the emulsifier without the admission of any water or steam. The machine then delivered a steady stream of oil-free water and an oil containing 0.18 per cent. of moisture and 0.01 per cent. of dirt, a result which is quite satisfactory. There were no fluctuations, and no interruptions except for discharging the bowl at regular intervals. The feed temperature was constant at 90°C.

In this last trial, the emulsifier served no useful purpose other than providing a channel for the mixture. It was therefore arranged to lead the mixture from the tank by a direct pipe to the centrifuge, abandoning the emulsifier. As a result, an output of 300 gallons of oil with 150 gallons of oil-free water per hour was obtained. It is evident that this rate of feed, 450 gallons per hour, is overloading the machine, for the oil from the last trial contained 0.28 per cent. of moisture and 0.02 per cent. of dirt. If the feed were adjusted to 300 gallons per hour, delivering 200 gallons of oil, the machine is clearly capable of giving as satisfactory results as in the trial previous to the last.

Summary.

The refining of palm oil direct from the extractors, in a continuous process eliminating boiling and settling in tanks, can be carried out by the Titan Sludge Separator.

Such a machine was installed temporarily at Serdang by the makers for the purpose of trials and results from it showed that, for regular use, a strainer with positive mechanical action would be essential, such makeshifts as wire gauze stretched on frames or boxes being unequal to the task of removing fibre and coarse solids which would clog the machine.

The machine is capable of delivering refined palm oil of purity equal to the existing standard at the rate of 200 gallons per hour, with no appreciable loss of oil in the water discharge. There is a considerable quantity of sludge to be dealt with, but this separates very easily on standing. The output of oil can be increased to 300 gallons per hour, with a slight falling off in purity which further adjustment might rectify.

The conditions for achieving this result are simple. The crude mixture from the extractors (which is roughly one-third water) is strained, agitated vigorously and heated with live steam in a tank, then fed to the centrifuge,

which is fitted with medium or fairly long regulating screws. The machine thus receives a uniform feed at a steady high temperature. Short regulation screws involve a loss of oil with the water discharge.

The conditions which cause failure are a fluctuating feed of irregular composition and an insufficiently high temperature. The contact emulsifier supplied with the centrifuge by the manufacturers, Messrs. Titan, is not only unnecessary but is responsible for the conditions of failure. The water expelled with the oil from the palm fruit is sufficient if the mixture is thoroughly agitated and heated in the supply tank.

The Titan separator not only eliminates the boiling and settling tanks, but also the simpler centrifugal purifier which is used in any case. Further information regarding price and upkeep is obtainable from Messrs. J. Hindhede & Co., Singapore.

AGRICULTURE IN KELANTAN

BY

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Kelantan, lying between latitudes 4° 35′ and 6° 15′, is the most northern of the east coast States of the Malay Peninsula. It is bounded on the north by the China Sea, on the east by the China Sea and the State of Trengganu, and on the south by the State of Pahang, while the State of Perak and the Patani District of Siam form the western boundaries.

The situation of the State renders it subject to greater seasonal climatic variation than is found in the States to the west of the central range of mountains, and well defined wet and dry seasons are experienced. The wettest months of the year, namely November, December and January, occur during the North-East Monsoon which extends over the period October to March. The dry season occurs in the months April, May and June, when monthly precipitation is small; this period corresponds to the early portion of the South-West Monsoon. The remaining six months of the year are showery. Rainfall records over 25 years show variations in annual precipitation from 84 to 194 inches. Though wind, often accompanied by rain, is experienced during the North-East Monsoon, this is of insufficient strength to cause damage to crops other than rice. It will be realised that the seasonal nature of the climate makes the planting date of all crops a matter of extreme importance.

For descriptive purposes Kelantan may be divided into two separate portions, the northern plain and the hilly portion to the south.

The northern plain is an immense tract of flat, or only slightly undulating, land through which the Kelantan River and other smaller rivers, streams and back waters pass. This plain is continuous with corresponding stretches of land which are found in the Patani District of Siam in the west and the Besut Province of Trengganu to the east. The plain stretches inland from the coast for a distance of from ten to fourteen miles when it rises into foothills. The soil immediately adjoining the coast is exceedingly sandy in nature and can only with difficulty support a thin growth of wiry grass and stunted bushes. This type of soil extends along the entire coast and is found inland for distances up to three miles, having been left in the form of raised beaches by a receding coast line. Immediately behind the belt of sandy soil a narrow strip of deep organic soil occurs, while the soil of the main body of the plain is a fertile loam of alluvial origin. From the plain one passes to low undulating foothills, lateritic in nature, and these hills become progressively steeper until in the south, mountainous land, with occasional limestone outcrops, is found.

The northern plain is very densely settled and carries a population of between 500 and 1,000 persons per square mile. This population, the great majority of which is engaged in some branch of agriculture, is almost exclusively of the Malay race. The southern portion of the State, with the exception of narrow strips along rivers and railway, is almost entirely undeveloped and the surplus population of the plain shows little inclination to move into this area.

Most of the rubber produced in Kelantan comes from small holdings in the hilly portion of the State and it is here that all European estates are situated. The European estates generally depend upon imported labour, but one estate employs only local Malays.

Soils and drainage facilities are, for the most part, well suited to the successful cultivation of this crop and diseases are little in evidence. Until recently rubber produced by small-holders was sold in the form of blocks which contained up to 14 per cent. of water and large quantities of sand, scrap, and other impurities and were of a most unattractive odour and appearance. Within the last year, however, propaganda and demonstration have effected considerable improvement in the quality of the product. A recent development is the establishment in Kota Bharu of a rubber factory in which block is converted into blanket crêpe.

The chief coconut producing area is the locality in and adjoining the delta of the Kelantan River. The crop has been planted extensively both by European companies and small-holders along the coastal sandy belt, but, with the exception of a few isolated spots, these estates and holdings have failed to produce economic crops, and considerable areas have been abandoned. As elsewhere in Malaya, coconut palms occur in the majority of kampongs, but the produce of such scattered palms is either consumed in the fresh state or converted into oil for domestic use by the owners of individual holdings. Owing to the pronounced dry season it is possible to cure copra by sun-drying during a number of months each year and during this season copra of fair quality is produced. During the North-East Monsoon, however, it is necessary to resort to kiln drying and, as small-holders' kilns are somewhat primitive, the quality of the product deteriorates during the wetter months of the year. As a result of the operation of European firms which vary the purchase price according to the quality of the product, the standard of copra exported has been appreciably raised in the course of the past three years. It is noticeable that the crop exhibits a seasonal variation which is considerably more marked than in the western States and, during the period from the middle of February until the middle of April, ripe nuts and copra are invariably scarce.

Almost the entire northern plain is devoted to the cultivation of padi, of which Kelantan contains an area second only to that of Kedah, though from the point of view of production, the State occupies only third place among

other States and Settlements in Malaya. The average yield per acre of padi is low as judged by Malayan standards and the various reasons for this will be mentioned in subsequent sections.

Two distinct types of padi are cultivated, namely wet padi, or *Padi Chedongan* and dry padi, *Padi Tugalan*. This dry padi must not be confused with the dry or hill padi, *Padi Huma*, found in other parts, as the methods of cultivation differ in many respects.

As is to be expected in an area of such a size, a very large number of varieties of padi, varying in soil and water requirements and period of maturation, are to be found. The people have in the past made little effort to maintain pure varieties, with the result that the crop is of a very mixed character which reflects on the final yield. Irrigated areas form an insignificant percentage of the whole and the crop is therefore reliant on an adequate and well-distributed rainfall during the monsoon. The fact that local soils are of a more porous character than those of other padi-growing areas renders the crop more liable to damage by drought and, in addition, the people show little natural aptitude in taking water from drains and small streams, or in utilising water to its best advantage when it is brought to their fields. A further point militating against high yields is that the State carries a very large stock of cattle and buffaloes for which little grazing accommodation has been provided; this stock grazes on the padi land during the dry season and, in addition to causing great damage to bunds and watercourses, constitutes a very severe drain on the store of plant nutrients in the soil.

Planting of wet padi commences in the low-lying areas early in June and is finally completed in the higher and, therefore drier areas, towards the end of November. The seed is broadcast in nurseries usually prepared on high land in close proximity to the cultivator's house where, though experiencing damage by drought, the nurseries are less liable to destruction by wandering stock. The date of sowing is most frequently decided by the position of the Pleiads in the sky, but the period in the nursery depends on the amount of rain which has fallen and been retained on the land which latter is prepared by ploughing. If rains are unduly late seedlings may remain in the nursery for periods up to three months, which exigency in itself is sufficient to ruin the crop. Harvesting of the main crop commences in February and is completed in April, the operation being performed by the small finger knife (*Ketaman*). Padi is most frequently stored in the ear, though it is at times threshed by foot and winnowed prior to storage.

The dry type of padi is cultivated on high land which will not retain water. The varieties planted are distinct from those planted on wet land and are less numerous. They differ greatly from one another in such characters as size and shape of grain and length of maturation period and in their ability to withstand flooding, while two varieties exist which may be planted under either condition. Preparation of the land for this crop is laborious though the aims are similar to those in view in the cultivation of spring oats. It

entails, according to local custom, four ploughings and harrowings before the land is considered fit to plant. The final cultivation attains a depth, not otherwise possible with the native plough, of about 4 inches and the harrowing brings the soil into a fine tilth. Planting, by dibbling in the seed in rows about 1 ft. x 1ft., is performed immediately after the last harrowing. The crop appears above the ground after about six days and is frequently given a dressing of ashes prepared by burning a mixture of soil, cow-dung and coconut fronds. Subsequent cultivation is confined to weeding which is done as frequently as the weather allows, for should showery or wet weather follow planting, weeding is impossible and the crop proves a failure. As the land on which this type of padi is cultivated becomes baked and hard during the dry season, it is necessary to postpone the preliminary cultivation until the soil has been softened with rain, and, owing to the small size of the local cattle and poor design of the plough, it is necessary to repeat cultivation a number of times to achieve the required depth and tilth. These factors tend to postpone planting until the season when showers are of daily occurrence and the crop fails as already stated. This type of padi requires more labour and produces yields considerable lower than does wet padi; it can, however, be grown on land where the cultivation of wet padi is impracticable without expensive irrigation and is important in the economy of the country in that it provides a large number of people with their basic food. Maize and the dwarf form of cow pea, *Vigna catjang* are frequently interplanted with dry padi and provide food for the cultivator while the main crop is maturing.

Arecanut is nowhere cultivated as a sole crop, but occurs in all the mixed holdings and provides the peasant with ready money. The harvest occurs in April and May, the whole nuts being split and sundried after which the kernels are extracted and exposed to the sun for a further period before sale to Chinese buyers as "splits".

During the dry season tobacco and vegetables, such as cucumber, gourds, beans and groundnuts, are frequently cultivated on dry padi land where manuring and watering are necessary to enable crops to thrive and mature. The manure used is usually in the form of ash as applied to dry padi, though the practice of applying cow-dung without burning it is extending. This system of inter-season cropping on dry padi land would be capable of considerable extension, were vegetable plots not continually subject to damage by wandering stock.

Large quantities of mangosteens, pineapples, rambutans, and pomeloes of good quality, are produced, chiefly in the vicinity of Kota Bharu. The main harvest occurs somewhat later than on the west coast and, apart from the varieties mentioned, fruit is comparatively scarce in the markets.

The fact that the State carries a very heavy stock of cattle and buffaloes has already been mentioned. These animals are used for meat and for the cultivation of wet and dry padi; they form an important item in the list of exports. The cattle are small in size and come slowly to maturity, but are

extremely hardy and resemble closely those found in South Siam. During the dry season the animals are grazed on the padi lands, where they do considerable damage, while during the padi season they are tethered on roadsides and in holdings to gain a precarious living on what little grass is to be found. The latter is frequently supplemented by grass which the owners cut from bunds and among the growing padi, with chopped banana stems and any other available vegetable material. The conditions will be more readily appreciated when it is mentioned that peasants frequently go five miles to cut grass for their cattle, and that a common excuse given for failure to weed wet padi is that, were the cultivator to do so, he would be unable to obtain sufficient fodder for his animals. By the time that the padi crop is ready for harvest the stock is generally reduced to a hide-bound condition, while the fibrous nature and dirty state of fodder at all seasons give rise to intestinal disturbances. The export of cattle and buffaloes from Kelantan was prohibited for a number of years, but this prohibition has now been rescinded and a valuable export trade exists with Singapore. Sheep are of little economic importance, though small flocks are to be seen, particularly in the vicinity of Kota Bharu; the animals are of very small size and bear a very short harsh coat: the mutton, however, is palatable, if slightly hard.

Every small-holder throughout the State rears a number of hens which form an important part of the diet; ducks are common. The local hens appear to be of extremely mixed parentage, but the long legs and light body of the game fowl are predominant. The birds lead a precarious existence, little or no attention being paid to them, and for the most part they are housed in small draughty sheds which are situated underneath the dwelling of the owner and are never cleaned. Hens are generally allowed to forage for themselves, finding food in the kampong among refuse and the waste padi and bran left after threshing and grinding. Epidemic poultry diseases are of not infrequent occurrence, usually during the wet season, and occasion considerable loss. Within the past three years a valuable export trade has developed with Singapore.

The main markets for peasant produce of both perishable and non-perishable nature are Kota Bharu, Tumpat, Kuala Krai, Pasir Mas, Pasir Puteh and Bachok. In addition to these there are permanent daily markets in small villages throughout the State and in these disposal of all produce can be rapidly effected by the grower. In the majority of cases these markets are comparatively empty until 11 a.m. or later in the day, as cultivators frequently have to carry their merchandise for considerable distances across the plain. Non-perishable goods are purchased in small villages and markets by small dealers who in turn sell to the larger dealers in the towns whence export, most frequently to Singapore, is effected.

Means of communication on that portion of the northern plain lying to the east of the Kelantan River are extensive, as metalled roads run south to Kuala Krai and south-east and east to Pasir Puteh and Bachok. In addition

to these, a considerable mileage of earth roads and tracks exists, and all these means of communication facilitate the marketing of produce. On that portion of the plain lying to the west of the river and in the southern portion of the State, transport is almost entirely confined to river and railway. The State is connected with Siam, the Federated Malay States and Singapore by the Federated Malay States Railways and by this means the export of cattle, poultry and a considerable quantity of rubber is effected. Alternative centres of export are the ports of Tumpat, Bachok and Semerak where coastal boats call, collecting copra, arecanut, rubber and other goods for conveyance to Singapore. Favourable rates of transport are granted by both the Railways and shipping companies but, even in these circumstances, cost of transport constitutes an important item in the total cost of production of agricultural commodities, while the time taken to reach the market limits the variety of articles which can be exported.

In view of the dense population and close settlement of the northern plain, development of agricultural land in Kelantan must in future be confined to the southern portion of the State, where the hilly nature of the country points to concentration on permanent rather than temporary crops. Considerable areas of South Kelantan run to high altitudes, particularly on the Perak boundary and in the vicinity of Cameron Highlands, and entry from this point may well reveal land suitable for the production of coffee, tea and citrus fruits of a quality not obtainable on the plains. It may be mentioned in this connection that it is at present possible to travel by road from Cameron Highlands to a point less than four miles distant from the Kelantan boundary.

Alienation of agricultural land in lots of over 100 acres in extent is effected in the form of grants and is subject to conditions imposed by the Superintendent of Lands. Survey fees for such areas amount to two hundred and fifty dollars, one dollar per acre being charged for each additional acre up to 300 acres, while a diminishing scale of fees per acre is in force in respect of each subsequent additional hundred acres. Premium payable on grants varies between ten and twenty five dollars per acre for land on which the planting of rubber is prohibited, while an annual rent of one dollar per acre is charged for the first six years and three dollars per acre at the expiration of that period.

Land for small holdings is alienated to the indigenous population on reduced terms, particularly in the case of rice land which, in order to increase the area under this crop, is exempted from premium, while survey fees are charged at one dollar per acre for a minimum of three acres.

CONDITIONS ON RUBBER SMALL HOLDINGS IN MALAYA.

Prepared by the Economic Branch of the Department of Agriculture, S.S. and F.M.S., in collaboration with the Field Branch of the Department.

Rainfall.

April was a very wet month throughout the Peninsula, but weather conditions were more normal during the other two months, May being moderately dry, except in certain parts of Johore, and June experiencing average rainfall.

Prices.

Tables I and II, covering several centres in each State, show the lowest and highest prices at which rubber was bought and the mean of the extremes.

Following the upward trend of the market, prices improved steadily during the quarter.

Production.

Production of rubber on small holdings during the first two quarters of this year are give in Table III, together with figures for 1934 for the purpose of comparison. The table is compiled from the monthly report of stocks, production, imports and exports of rubber, published by the Registrar-General of Statistics, S.S. and F.M.S.

Tapping.

Table IV shews the result of the quarterly survey of areas untapped on small holdings. Estimates are obtained by counting the number of such areas and applying the percentage to the total area of small holdings in the District.

The area out of tapping on small holdings in the Federated Malay States at the end of June 1935 had increased to 27 per cent. (144,500 acres) as compared with 17.5 per cent. (93,100 acres) at the end of the first quarter. The corresponding figures for the Straits Settlements were 18.9 per cent. (22,000 acres) and 15.4 per cent. (17,900 acres).

The production figures in Table III do not reflect this increase in areas out of tapping, but this fact is probably accounted for by the incidence of the "wintering" season in the first quarter of the year.

Reports continue to indicate that tapping is decreasing owing to the relatively more profitable sale of coupons without rubber, and to the low price offered for non-couponed rubber. In Krian South dealers have refused to purchase rubber without coupons and the small holdings concerned have ceased

Table I.

Lowest and Highest Rubber Prices Paid by Local Rubber Dealers.

(In Straits dollars per picul (133 1/3 lbs.))

2nd Quarter 1935.

	Penang	Perak	Selangor	Negri Sembilan	Pahang	Malacca	Kedah	Johore
				APRIL				
Smoked sheet	20.50-24.00	19.00-24.00	20.00-23.00	20.00-23.50	17.50-24.00	21.00-24.00	21.50-27.25	19.50-23.50
Unsmoked sheet	19.00-23.00	16.00-21.60	16.00-21.60	17.00-22.00	18.00-22.50	19.25-23.00	18.00-22.00	17.50-22.10
Scrap	12.00-16.00	13.00-16.00	10.00-16.00	14.00.16.75	—	13.00-18.00	7.00-15.00	3.75-17.00
				MAY				
Smoked sheet	22.00-25.00	20.50-25.50	20.50-25.00	20.00-24.50	18.50-25.00	22.00-25.00	22.00-28.50	19.00-24.50
Unsmoked sheet	20.50-24.20	18.00-23.50	18.00-23.00	18.50-23.00	19.00-23.00	19.50-24.00	18.60-23.00	15.00-23.50
Scrap	13.00-17.00	15.00-16.00	13.00-16.00	15.00-18.00	15.50	13.50-18.00	6.70-16.00	3.00-19.00
				JUNE				
Smoked sheet	22.00-26.00	20.00-25.50	21.00-26.00	22.00-25.60	20.00-26.00	23.00-25.50	23.50-25.50	22.00-25.70
Unsmoked sheet	21.50-25.30	19.00-24.00	18.00-24.00	20.00-24.50	19.00-23.00	20 00-24.50	21.50-24.00	19.75-24.50
Scrap	13.00-18.00	12.00-15.00	14.00-19.00	15.00-18.50	17.00	14.00-19.00	14.00-16.50	15.00-20.00

Table II.

Mean of Lowest and Highest Rubber Prices Paid by Local Dealers at a number of Centres in each State.

(In Straits dollars per picul (133 1/3 lbs.))

2nd Quarter 1935.

	Penang	Perak	Selangor	Negri Sembilan	Pahang	Malacca	Kedah	Johore
				APRIL				
Smoked sheet	21.50-23.76	20.74-22.49	20.30-22.81	20.50-22.90	19.25-22.83	21.83-23.33	23.33-24.41	20.80-22.58
Unsmoked sheet	19.62-22.87	18.79-20.35	17.66-19.86	17.96-21.00	18.40-21.37	19.75-22.00	19.33-21.83	19.01-21 02
Scrap	12.87-14.75	14.00-15.00	12.00-14 00	15.00-15.94	—	14.33-16.66	11.16-12.83	12.78-15.60
				MAY				
Smoked sheet	23.00-24.75	21.78-23 82	22.33-24.61	21.46-23.92	20.30-23.82	22.86-24.33	24.16-25.83	21.89-23.39
Unsmoked sheet	21.25-23.67	19.90-21.51	20.25-22.25	19.42-22.08	19.40-22.10	19.83-23.00	20.20-21.83	20.15-21.95
Scrap	14.62-15.75	15 00-16.00	14.00-14.50	15.33-17.33	15.50	14.33-17.33	11.56-13.00	14.10-15 77
				JUNE				
Smoked sheet	23.60-25.33	22.94-24.73	23.00-25.20	23.33-24.68	21.58-24.57	23.16-25.26	24.16-25.16	23.59-24.74
Unsmoked sheet	22.37-24.70	21.16-22.96	21.00-23.20	21.17-23.04	20.25-22.37	20.25-23.50	22.16-23.33	21.95-23.35
Scrap	14.87-16.37	13.00-14.50	1 .33-17.00	16.16-17.66	17.00	15.50-18.33	15.00-15.83	16.87-18.61

tapping pending the next coupon issue. Padi planting operations and fruit harvesting are mentioned as two additional reasons for reduced tapping.

Heavy bark consumption is reported from some Districts, and high tapping of trees on older holdings is now popular in Negri Sembilan, due to insufficient bark reserves being maintained on the lower panels.

Condition of Holdings.

The service of Asiatic Rubber Instructors continues to produce satisfactory results and reports show that small-holders are paying serious attention to the advice of these instructors. Having regard to the large area out of tapping the general standard of upkeep of small holdings is considered satisfactory.

It is reported from Pahang that portions of large Chinese holdings were bud-grafted during the quarter.

Diseases.

Mouldy Rot was the only disease of consequence during the quarter, but cases of root diseases were prevalent in certain Districts of Johore.

The wet weather assisted the development of Mouldy Rot, but control was well maintained as small-holders now realize the value of using the various approved fungicides.

Table III.

Production of Rubber on Small Holdings.

(in tons)

	Total half-year 1934	1st Quarter 1935	2nd Quarter 1935	Total half-year 1935
Federated Malay States ...	56,703	16,736	17,374	34,110
Unfederated Malay States ...	41,437	16,021	13,593	29,614
Straits Settlements ...	14,694	2,867	3,432	6,299
Total ...	112,834	35,624	34,399	70,023

Table IV.

Estimated Acreage of Tappable Rubber which was out of Tapping on Holdings of less than 100 Acres, at the end of June, 1935.

PERAK				SELANGOR				NEGRI SEMBILAN				PAHANG			
District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage
Batang Padang	37,288	5,200	14	Klang	18,879	5,100	27	Seremban	19,241	14,400	75	Raub	7,361	600	8
Kinta	34,180	3,400	10	Kuala Langat	29,263	4,700	16	Tampin	17,947	6,800	38	Kuala Lipis	15,951	7,000	44
Kuala Kangsar	43,485	12,200	28	Ulu Langat	38,867	9,300	24	Kuala Pilah	17,470	4,200	24	Bentong	13,600	3,400	25
Upper Perak	13,774	2,100	15	Ulu Selangor	30,632	7,700	25	Jelebu	6,270	1,400	22	Other Districts†	31,223	9,300	29
Larut & Selama	51,407	9,800	19	Kuala Lumpur	21,174	5,500	26	Port Dickson	10,653	7,200	68				
Krian	9,751	5,500	57	Kuala Selangor†	9,379	2,700	23								
Lower Perak*	47,937	11,800	28												
Dindings	7,279	5,700	78												
	245,101	55,700	23		148,194	34,500	23		71,581	34,000	47		68,135	20,300	30

MALACCA				PENANG & P. WELLESLEY				SINGAPORE			
District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage
Central	17,687	4,900	28	North	3,241	400	11	Singapore	12,781	1,400	11
Alor Gajah	31,387	6,000	19	Central	7,067	2,600	37				
Jasin	24,971	5,400	22	South	8,149	200	3				
				Penang	11,114	1,100	10				
	74,045	16,300	22		29,571	4,300	15		12,781	1,400	11

The percentage of areas out of tapping in March, 1935, was as follows:—Perak 13, Selangor 15, Negri Sembilan 39, Pahang 15, Malacca 18, Penang and Province Wellesley 13, Singapore 5.

* Estimated from percentage for Kuala Kangsar.

† Estimated from percentage for other Districts in the State.

Grades of Rubber.

Although the advantage of producing smoked sheet is being more and more appreciated by small-holders, there is still a considerable quantity of air-dried rubber prepared. It will be noted from the following summary that sales of scrap continue to be negligible.

Kedah.—The percentages of smoked and unsmoked sheet sold during the quarter were: North Kedah 65, 27; Central Kedah 53, 40; South Kedah 48, 44. These figures shew a considerable reduction in the production of smoked sheet.

Johore.—There was a larger proportion of unsmoked sheet sold in Johore during the quarter under review. Average percentages for the three Circles are as follows: Johore South, smoked 17, unsmoked 74; Johore Central, smoked 26, unsmoked 71; Johore North, smoked 42, unsmoked 40.

Perak.—The percentages of smoked and unsmoked sheet sold in Perak varied in the different Districts and Circles. They were: Perak North, smoked 32, unsmoked 68; Krian and Selama, smoked 55, unsmoked 45; Perak Central, smoked 77, unsmoked 23; Perak South, smoked 31, unsmoked 69.

Selangor.—Only one District in Selangor does not produce smoked sheet; in all other Districts smoked sheet and scrap are produced exclusively.

Penang and Province Wellesley.—In contrast with the first quarter of the year, sales during the second quarter were almost entirely of unsmoked sheet, the percentages being: smoked 11, unsmoked 81.6.

Malacca.—The percentages of smoked and unsmoked sheet sold varied only slightly during the second quarter. They were: Central, smoked 63, unsmoked 29; Alor Gajah, smoked nil, unsmoked 91; Jasin, smoked 33, unsmoked 67.

Negri Sembilan.—There was again a marked preference for unsmoked sheet at some centres, but the average percentages of sales of smoked and unsmoked sheet were both 48.

General.

The general opinion expressed in reports is that the economic position of the small-holder remains sound although his coupon allowance has been reduced. The sale of coupons without rubber affords a certain income and leaves the small-holder free to augment it with work on other crops.

REVIEW OF THE AGRICULTURAL SITUATION.

Speech by His Excellency the Governor, Straits Settlements and High Commissioner, Malay States (Sir Shenton Thomas, K.C.M.G., O.B.E.) at the opening of the Twelfth Malayan Exhibition, August 3rd., 1935.

It is both a pleasure and a privilege for me to open the Malayan Agri-Horticultural Exhibition to-day, and in accordance with custom I propose to say a few words in review of some of the features of the agricultural situation and to point out certain objectives to which our agricultural policy should be directed.

Evidences of Increased Prosperity.

Within this Exhibition itself will be found quite definite evidence that the increase in the prosperity of Malaya, which had commenced when the Exhibition was held in June of last year, has on the whole been well sustained. I need only mention that the floor space covered by the Trade Section is about double that of last year and that the section comprises over 80 trade stalls, not including those in the special coconut section, as compared with 45 trade stalls in last year's Exhibition.

This is, of course, very pleasant; but in the world as it is to-day the prosperity of this or any country depends on strict attention to quality and on the efficient organization of industries. Without that, we cannot hope to retain even that moderate prosperity which we have attained to-day.

Rubber Position.

In many industries, organization to-day extends beyond the limits of a single country, as in the case of the International Rubber Regulation Scheme. The effect of this scheme during the first twelve months of its existence has been to maintain the average price of the commodity at a figure which, compared with that of the past few years, is reassuring. I know that it is contended that the present price does not allow of provision for a satisfactory standard of maintenance or a reasonable margin of profit but, when it is recalled that restriction is still so recent, the progress made gives hope for the future. I remind you here that, when the restriction on tin was introduced, the price rose at once only to fall again after a few months. But then it rose again to the level at which it has since been maintained. I see no reason why the experience of rubber growers should not be the same. The better prices of last year were not due to restriction so much as to the expectations resulting from the decision to introduce restriction. The world's stocks of rubber are

not yet sufficiently reduced, but all that I read and hear on the subject tends to indicate an improvement during the latter part of this year and in the future, and I trust that it may be so.

I am glad to say that the quality of the rubber produced on the large estates receives careful attention, but that which is produced on many small-holdings leaves room for much improvement; and since all rubber exported under the Regulation Scheme is regarded as clean and dry, a high percentage of moisture and dirt in the product represents a loss to the small-holder of exactly the same percentage of his export rights. I want the small-holder to realise that.

It is, however, satisfactory to record that the Asiatic Rubber Instructors who commenced work last year have already been able to give considerable assistance to peasant proprietors in preparing good dry rubber sheet. These Instructors are provided by the Rubber Research Institute of Malaya, which defrays all their expenses, but for the sake of convenience they work under the supervision of Field Officers of the Department of Agriculture. Their numbers have been increased from 11 to 16 by recruitment this year and they are now distributed over almost all of the States and Settlements.

Another step to encourage the production of good sheet rubber by small-holders, which has been taken during the year, has been the inauguration by this Association in accordance with a suggestion put forward by Mr. Shelley, then acting Chief Secretary to Government, when opening last year's Exhibition, of an All-Malayan Small-holders' Rubber Competition on the lines of the All-Malayan Padi Competition. District rubber competitions have been confined this year to parts of the country only, but it is expected that next year they will be held generally throughout Malaya. These competitions provide valuable opportunities for instruction.

Efforts to improve the quality of rubber produced on small-holdings are being undertaken energetically in the Netherlands Indies. This is an additional reason for maintaining vigorously our own efforts in Malaya.

Vegetable Oils.

A year ago the coconut and oil palm industries were passing through the most difficult period in their history, but to-day the position is slightly better. While, however, human agency in the form of the Regulation Scheme has been the cause of raising the price of rubber, I fear that the improvement in the coconut and oil palm industries has been brought about mainly by natural causes which may not recur, such as the recent drought in the United States, typhoons in the Philippines, malaria in Ceylon and the partial failure of the Indian groundnut crop. There has up to the present been no material alteration in the more fundamental factors influencing the situation which were set out in the Report of the Vegetable Oils Committee. I am afraid, therefore, that these industries, and more especially the coconut industry, must be prepared for severe competition in the future.

Among numerous measures recommended by the Vegetable Oils Committee for assisting the coconut industry was a suggestion that this Association might provide a special section at this Exhibition for the purpose of advertising the various uses of the coconut and its products. At the request of Government the Association took action on this and we see to-day in the special Coconut Section the wide range of products obtained from this palm and the numerous uses to which they may be put.

The Vegetable Oils Committee also drew attention to the need for a body representing all sections of the coconut producers which could assist in organizing the industry and in improving the quality of its products. It is, therefore, good to know that negotiations for the formation of a Vegetable Oils Section of the United Planters' Association of Malaya are well advanced and that this Section is likely to receive the full support of both the coconut and the oil palm industries. Among several matters which will require the attention of this Section when formed I might mention the important questions of producing a high grade product in sufficient quantity to attract the attention of the market and command an improved price, and also the desirability of increasing local consumption. This latter is a measure which is receiving close attention in other producing countries, such as Ceylon and the Philippines. I was told the other day at the Institute of Medical Research of the work that is being undertaken in search of a virus to exterminate—or at least to reduce the numbers of—rats which do such damage on oil palm estates and elsewhere. Furthermore, in the Agricultural Department the Mycologist is investigating the problem of stem-rot, and the Chemist is trying to produce an oil that is more palatable. I mention these points to show that the difficulties with which the vegetable oils industry is faced have not been forgotten.

The Canned Pineapple Industry.

In October of last year the Pineapple Industry Ordinance and Enactments were passed in the Colony, Selangor and Johore. Under the provisions of this legislation, sound progress has been made in improving the hygienic conditions in factories, and also in standardizing quality, thus assisting the industry to face the increasing competition which must be anticipated from several sources. Government is at present taking steps to obtain the services of a suitably qualified officer to assist and advise the packers in improving the quality of their product.

Experimental work is also in progress on the improvement of the fresh fruit and its method of cultivation. In this connexion I wish to draw attention to a problem which has arisen as a result of the change in status of the pineapple from that of a catch crop with rubber to that of a sole crop, and I allude to the problem of preventing soil erosion on the large properties which have recently been, and are still being, planted up with pineapples alone.

This problem must receive very careful consideration by all concerned, if large areas of land are to be prevented from becoming infertile and useless in the course of the next ten years.

Local Rice Production.

Much has been done in recent years to extend the area planted with rice, to improve the supply and control of irrigation water, and to increase the yield per acre by such methods as the use of high-yielding strains of padi and the control of pests. The season 1933-34 showed the largest area planted with wet rice and the highest crop on record. Last season climatic conditions were less favourable in some places and the total crop is believed to have been somewhat less, but on the whole it was still good. Satisfactory yields were obtained in the two large new padi areas, Panchang Bedena in Selangor and Sungei Manik in Perak, where efficient methods of water control have been provided and development is proceeding steadily.

The Department of Agriculture has for some years been advocating the planting of wide areas of land, where conditions are uniform, with a single pure strain of padi suitable to those conditions. If the padi is grown for milling, large supplies of uniform grain facilitate the production of rice of good quality. If the padi is grown for home consumption, uniform ripening facilitates harvesting and reduces damage by pests. Moreover, the strains of padi recommended by the Department for particular areas have been proved by extensive tests to give better yields than the local unselected strains. The policy advocated by the Department is meeting with satisfactory support from both growers and millers, but it has still much progress to make before it can be said to be universally adopted.

In the furtherance of this policy and in the maintenance of interest in padi-growing, the All-Malayan Padi Competition conducted by the Association should play an important part. This is the second year of the annual padi competition which has now become fully representative, since exhibits assembled here for the final stage of the competition—some 140 in all—include the prize winners at District competitions held in all parts of the country at which some 4,500 samples of padi have been judged. These local competitions have been very well supported and have aroused much interest among growers. They have also provided excellent opportunities for instruction on the various attributes of a good sample of padi and the means by which such samples may be produced.

Village Industries.

And now may I say a few words on the subject of Village Industries. This Association first interested itself in village industries as constituting a natural adjunct to peasant agriculture, and providing a useful and profitable occupation for the members of rural communities in their spare time. This section has, however, been extended in course of time to include various local

arts and crafts, some of which are necessarily related to agriculture. The Association has now provided considerably increased space for this section which has been well supported.

There can be no doubt that the Association by this means is giving useful assistance to local craftsmen. In proof of this statement I cannot do better than refer to the Annual Report of the British Adviser, Trengganu, for 1934. In this report you will see that the value of silk sarongs, cotton fabrics and metal work exported from Trengganu in that year was about $154,000 as compared with about $61,000 in the previous year, although there was no change in the price of these goods. The Adviser ascribes this increase in export to the publicity obtained for Trengganu craftsmanship by taking a stall at the Malayan Exhibition. You will find also here to-day a very interesting exhibit of arts and crafts from Kelantan.

The prosperity of Malayan agriculture depends on establishing a wide range of products, on improving the quality of our exports, and on increasing the efficiency of our marketing organization. To achieve these objects close co-operation among producers is essential and this I am glad to note is being achieved. Among the bodies which have endeavoured to encourage agricultural progress along these lines is the Malayan Agri-Horticultural Association, and I trust that this Association will continue to receive a full measure of public support.

The voluntary work that is done on its behalf, and on yours, is very great, and we ought to be sincerely grateful to all those who have spared no time or trouble to make this year's Exhibition a success. I should like to say here how sorry we are that Dr. Tempany, the Adviser on Agriculture, cannot be with us and to hope that his wife may soon be on the road to recovery.

I have much pleasure in declaring this Exhibition open.

INDIAN TARIFF ON COCONUTS.

According to *The Calcutta Commercial Gazette*,* the South India Chamber of Commerce has addressed a communication to the Government of India urging them to make an early revision of the tariff duties on coconuts and coconut products. A reply to the arguments advanced by the Chamber appears under the authorship of Mr. Thos. A. de Mel in a recent issue of *The Ceylon Observer*.† The following, taken from these two sources, is of particular interest to Malaya, whose position in this matter will be found at the end of this account.

The Chamber invited the attention of the Government of India to the recent report of the special sub-committee of the Imperial Council of Agricultural Research which investigated this problem and recommended an increase of the duties. As against this report, which Mr. Mel has not seen, he refers to the report on "Coconut Enquiry in India", prepared by Dr. J. S. Patel at the instance of the Imperial Council of Agricultural Research, wherein he states that there is no evidence to shew that the fall in prices of coconut oil and copra is due to the increased imports of these products into India.

The urgency of the question, the Chamber stated, would, of course, become clear to Government if they were to examine the progress of imports of coconuts and coconut products during the last quinquennium. During that period the import of coconut increased from 10.9 millions in 1929-30 to 19 millions in 1934-35; the import of coconut oil from 1.6 million gallons to 7.3 million gallons and of copra from 152 tons to 33,742 tons. There can be no doubt that this increase in imports took place to the detriment of local supplies. It could not be said that production in India suddenly fell short, because production is very inelastic, nor could it be said that the internal demand suddenly increased, because the tastes and habits of people change slowly and no great industrial use for the products has been discovered.

While not contesting the truth of the statement that imports of these products to India from Ceylon have steadily increased during the period in question, Mr. de Mel points out that these imports have not supplanted indigenous supplies but have been used in addition to them, to be crushed in Indian mills. "The production in India has not fallen short" says the Chamber. Can it be said that the local production has increased to such an extent as to meet the increased demand for coconut oil that has existed in India in recent years? The Chamber denies that there has been an increase in the internal demand. If there has been no increased consumption, what has happened to the large quantities imported during the last few years? On the contrary, it is contested that there has been a definitely increased demand, due in great measure, to the removal from India of large quantities of vegetable oils, the exports of which have more than doubled during this period. This is supported by Dr. Patel who points to the increased demand for soap and vegetable ghee products which has stimulated imports of coconut products.

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†9th July, 1935.

The Chamber is convinced that the increased import took place at the expense of the indigenous products. This statement is also borne out by the fact that the exports of copra, coconuts and coconut oil from Ceylon to non-Indian ports show a consistent and steady decline during this period, and those to Indian ports a steady increase. The Ceylonese producers, evidently meeting with severe competition in their other markets and being burdened with an inelastic supply, have been turning their attention to the Indian market in a larger and larger measure.

Mr. de Mel admits this fact, but points out that South India has interfered with this Ceylon trade by increased exports of vegetable oils from India to countries that used to import large quantities of coconut oil from Ceylon. He states that the exports of vegetable oils from India to the United Kingdom, Denmark, Italy, Sweden and Egypt, which in 1929-30 amounted to 340,762 gallons, had increased to 1,734,307 gallons in 1933-34.

The Chamber contended that the Government of India's tariff policy in recent years gave definite encouragement to these imports. Imperial preference was introduced in 1933 by which the duty on Ceylon copra and coconuts was reduced from 25 per cent. to 20 per cent. Mr. de Mel replies by stating that the British Empire countries purchased 35 per cent. of the total value of Indian merchandise exported from India during the year 1929-30, and in the year 1933-34 the percentage rose to 46. He assumes that the scheme of Imperial Preference was responsible for at least a part of this increase. In any case, the reduction of duty by 5 per cent. cannot, he considers, make a material difference to coconut producers in India.

According to the Council, the Government of India have been giving a still more stupendous encouragement by a steady reduction in tariff values. Between 1929 and 1935 the value of copra was reduced from Rs. 23 to Rs. 6 per cwt., of coconut oil from Rs. 30 to Rs. 10 per cwt. and of coconuts from Rs. 45 to Rs. 22-12 per thousand. The Government cannot be unaware that the current market prices are 40 per cent. above the tariff values fixed for 1935. The Government have frequently been making intra-annual revisions of tariff values when market fluctuations demanded. This was done even recently in the case of raw hides and skins.

The Chamber therefore urges that an immediate revision of tariff values should be notified for coconuts and coconut products. In conclusion, since the markets for these products have been depressing prices and impoverishing the ryots over a vast area and the market has been upset by speculative prices, the Chamber urges that whatever terms might be ultimately negotiated for a trade agreement with Ceylon, the present situation must be saved by an immediate increase in the import tariffs on coconuts, copra and coconut oil. Commenting on this demand for a revision of tariffs, Mr. de Mel points out that revision of tariff values from time to time is a necessary procedure when *ad valorem* duties are imposed, and the action of the Government of India in reducing the

tariff values on coconuts and coconut products, mentioned in the Chamber's communication, would appear to have been taken in conformity with this principle.

Everybody, says Mr. de Mel, who knows the market prices of these products in Ceylon will agree that the prices mentioned by the Chamber are the actual prices ruling in Ceylon at the present time; the adoption of these prices as tariff values cannot therefore amount to an undue partiality to Ceylon. The Chamber says that the actual prices of the products must be higher by 40 per cent. The only conclusion that one can draw from this is that the prices of these commodities ruling in India are 40 per cent. higher than the Ceylon prices. The prices of coconut products in Ceylon are the parities of world prices of such products and the exports to India must necessarily bear the following additional charges before they can compete with the products in India:—(*a*) The extra Rs. 2 to 3 per candy of copra that the Indian shipper usually pays over and above the parity prices; (*b*) the expenses of the local Indian shipper; (*c*) the shipper's profits; (*d*) the freight charges to Indian ports; (*e*) the import duty of India; (*f*) the landing and other charges in India; and (*g*) the Indian importer's profits.

There is also the additional advantage which the Indian copra enjoys over the Ceylon product in that the Indian miller prefers the former to the latter owing to its higher oil content, the excess amounting to 2½ per cent.

Mr. de Mel concludes: "It would thus appear that Ceylon is not competing unfairly with India and that the agitation in South India is not founded on any genuine grievance, but that it is probably actuated by the reduction of the large profits that the producers used to enjoy before the economic depression."

.....

It is not for us to pronounce a verdict on this matter; we have but attempted to place the pros and cons of the case before our readers, because the question of the attitude of the Indian Government to imports of coconut products is of concern to the Malayan industry.

Malaya commenced exporting coconut oil to India in 1932, in which year 906 tons were shipped. In the following year this figure had increased to 4,390 tons, and in 1934 it was 4,672 tons, valued at $389,630. During the first six months of 1935 our shipments of coconut oil to India were 3,994 tons, valued at $453,750. It is evident, therefore, that India as a market for Malayan coconut oil is of growing importance.

Until the beginning of 1935, Malaya made no shipments of copra to India. In the first three months of 1935, however, 941 tons, valued at $80,547 were shipped, but there have been no further shipments since the end of March.

It is pertinent to add that coconut oil and copra from Malaya are given the same preferential treatment on import into India as imports of these products from Ceylon.

Husked coconuts and unhusked coconuts, hitherto, have been unable to compete in the Indian market by reason of the fact that the import duty on entry into India has been respectively twice and three times as much as was paid on similar products imported from Ceylon. As a result of representations made on this point, the Indian Government has recently agreed to admit the import of coconuts shipped from Penang at the same preferential rate as is allowed to coconuts from Ceylon or other parts of the Empire. It should be understood that shipments from Penang must be of coconuts grown in Malaya. Ceylon and other Empire producers, however, still have an advantage in that their coconuts are valued for tariff purposes at a considerably lower figure than are coconuts from Malaya.

Malaya already possesses a good trade in exporting fresh coconuts to Burma in which market there is little or no competition from Ceylon. It is, however, doubtful, in view of the difference in tariff value between the nuts from Ceylon and Malaya, if the recent concession will result in the extension of our trade with India.

UNITED KINGDOM IMPORT DUTY ON SOYA BEANS.

An import duty of 10 per cent. *ad valorem* on soya beans imported into the United Kingdom from foreign countries was imposed from August 1st 1935. Imperial production is free, but in view of the fact that there are no imports from Empire sources, this is of no importance at present.

The Secretary of State for the Colonies explained in the House of Commons on May 1st, that, while one cannot say with certainty what will be the prospects for the cultivation of soya beans within the British Empire, there is certainly ground for hope that there may be commercial production. It is not, however, primarily in order to stimulate the production of soya beans in the Empire that this preference has been so keenly sought, but because soya beans are a serious competitor of the other oil-yielding substances which the Colonial Empire can produce, such as palm kernels, groundnuts and copra. Every Colony producing any of these commodities asked for this preference, and these Colonies are experiencing very considerable depression in their production.

The Secretary of State urged the concession on the House not only on its own merits, but in return for the tremendous benefit which has been given by the Colonies to the textile trade of the United Kingdom by the application of the Textile Quota.

Any improvement in the United Kingdom market for copra or palm kernels, as a result of this legislation will be to the benefit of Malaya from which country a considerable quantity of copra and coconut oil is exported, while increasing quantities of palm kernels are now coming into the market.

AGRICULTURAL SHOWS.

Muar (Johore) Agricultural Show.

An Agricultural Show, organized on a State basis, was held at Muar, Johore, on 11th and 12th July 1935, and was formally opened by H.H. the Sultana of Johore, who accompanied H.H. the Sultan.

In addition to the usual agricultural sections, arts and crafts, needlework, village and school industries, and a baby show were included. Special exhibits were prepared by the Medical and Health and Agricultural Departments, while the Prison Department and several local firms operated stalls for trade purposes.

In the agricultural sections, fruit and vegetables were very well represented, the quality of the produce entered being of a very satisfactory standard. Entries in the sections devoted to fibres, foodstuffs, oils and fats were not as numerous as anticipated, particularly in the classes for copra, coconut oil, arecanut, tobacco, tapioca and sago produce and some of the more popular minor products; a satisfactory standard of quality was, however, maintained. Entries in the poultry section were satisfactory from the point of view of numbers, but the quality of the birds shewn indicated the necessity for much instruction in relation to methods of husbandry.

The sections devoted to school and village industries and needlework were very well supported.

This show served to provide a very useful culminating point in connexion with the Johore section of the All-Malayan Padi Competition, and the All-Malayan Small-holders' Rubber Competition. In the former, a very good sample of a "Nachin" type and two good samples of "Serendah Kuning" were selected to represent the State in the final competition to be decided at the Malayan Exhibition in August. All these padi were from the Segamat District.

The small-holders' rubber competition attracted 172 entries, *i.e.* 35 in the smoked sheet class and 137 in the air-dried class, the majority of which attained a high standard of excellence for small-holding production. It was unfortunate, however, that several exhibitors failed to appreciate the difference between air-dried and wet.

The special exhibit prepared by the Department of Agriculture gave particular prominence to crops of local importance such as copra, tobacco, arecanuts, fruit and padi; the models, photographs and exhibits displayed attracted considerable attention. Department pamphlets in Malay, Chinese, Tamil and English, on numerous subjects of local importance were distributed. In connexion with rubber, the Asiatic Rubber Instructors were in attendance and demonstrated methods for production of good quality sheet, and operated a full-sized smoking cabinet capable of dealing with 150 sheets of rubber.

This contrivance, which can be erected for a few dollars and operated at a negligible cost, excited unusual interest and it is confidently expected that its simplicity and efficiency will result in emulation in many of the northern villages.

Further instruction was undertaken during the evenings with the assistance of the equipment of the Rural Lecture Caravan. Lectures, delivered per medium of a loud speaker, and illustrated by lantern slides, were given on rubber manufacture, poultry husbandry, copra manufacture and vegetative propagation of fruit trees, and instructive cinema films were screened. Attendances each evening were computed at approximately 3,500.

It is estimated that nearly 30,000 people attended the Show during the two days, the attractive sports programme and entertainments during the afternoons and evenings being no doubt largely responsible for such excellent support.

Bentong Pahang District Agricultural Show.

The second annual Bentong Agricultural Show was held on 21st July 1935. The Show was opened by H.H. the Sultan of Pahang in the presence of the Hon'ble the British Resident of Pahang and a large gathering.

There were 84 competitive classes, divided into eight sections, *viz.*: cereals, fruits, vegetables (Malay), vegetables (Chinese), minor economic crops, arts and crafts, poultry, rubber.

The most important class was that devoted to padi, organized under the All-Malayan Padi Competition rules. In this class there were 104 exhibits, the majority of which were of good quality.

The small-holders' rubber section was organized in accordance with the new All-Malayan rubber competition. The section was well supported, especially the class for smoked sheet, of which some good first-quality exhibits were shewn. The unsmoked sheet was mostly poor and insufficiently dried.

In addition to competitive classes, the Department of Agriculture staged exhibits of an instructional nature dealing with rubber, padi, poultry, and propagation of fruit trees.

The show was an undoubted success, and on the whole, the general standard of exhibits, lay-out and organization was definitely better than last year. There were also signs that the exhibitors had taken care in selecting and preparing their exhibits.

Review.

Diseases of Poultry.

H. P. Bayon. 216 pages, illustrated. The Feathered World, Ltd. London. 1934. Price five shillings.

Poultry farming has undergone rapid expansion in England since the conclusion of the Great War; but, unfortunately, this has been accompanied by a serious increase in the incidence of disease. What farmers had hitherto regarded as a comparatively simple and safe enterprise has thus developed into one which is attended by no little risk and therefore requires scientific protection. The interest of a number of physiologists and pathologists has been attracted by the problem and, to meet the growing demand of better-educated poultry farmers for information on the recognition and control of those diseases which may mean so much to their balance-sheets, various more or less simple publications on the subject have been produced.

This, the second edition of "The Feathered World's" contribution to such literature, is well planned and merits a good reception in England. In the preliminary chapters is given a broad outline of the structure and physiology of the fowl, the nature of disease in general, and the relationship which exists between disease and such factors as breeding, feeding and housing—thus offering the farmer a measure of fundamental knowledge which he too frequently lacks. Dr. Bayon then proceeds to describe in detail the large number of ailments, serious and otherwise, with which the English poultry farmer may have to contend.

Fowls in Malaya are liable to serious epidemics of disease, but their precise nature is at present unknown. In this respect, the utility of Dr. Bayon's book is somewhat limited. Two facts, however, are to be observed. In the first place, a number of ailments which he describes have their direct counterpart in our own fowls. In the second place, preventive measures based on strict observance of the general principles of sanitation and hygiene are of prime importance. The book supplies valuable information in relation to these aspects of the subject, and it can therefore be recommended to anyone who is interested in sound poultry husbandry in this country.

G. E. M.

Departmental.

FROM THE DISTRICTS.

Compiled by the Chief Field Officer from Monthly Reports submitted by Field Officers.

July, 1935.

The Weather.

Very dry weather was experienced except in the Malacca—Port Dickson area where rainfall was up to average. In Perak North and in Tangkak and Segamat in Johore there were heavy showers early in the month, but little rain afterwards. The situation in Krian showed signs of becoming serious towards the end of the month.

Remarks on Crops.

Rubber.—There was a general slight decline of prices during the month. Mouldy rot disease remained generally quiescent due to dry weather except in Sungei Siput South, where there was a short outbreak which received prompt attention, and in Malacca where a fair number of cases was reported. In many areas tapping, which had been suspended or greatly reduced due to exhaustion of coupons and preoccupation with fruit harvest and preparation of padi lands, was resumed. In Krian District pressure of work in the padi fields led to alternate-day tapping or even to suspension of tapping. In general, it is anticipated that there will be a conservative trend in that District during the current quarter. In Singapore the Agricultural Officer conducted a survey of a typical Chinese small-holding area and came to the conclusion that at present prices and rates of assessment rubber was not a valuable asset to the small-holder and that a better return was being obtained from similar areas planted with food-stuffs and carrying livestock.

Interest has been shown in small-holders' rubber kilns particularly in Batu Pahat area where demonstrations aroused considerable interest. It is noted that in the Kluang District there is no incentive to the use of these kilns since prices for unsmoked rubber are practically the same as those for smoked sheet.

Padi.—Shortage of water resulted in retardation of operations in many areas. In Krian the majority of nurseries made satisfactory progress and water supply was fairly well maintained in north-west Krian. The higher areas of Jalan Bharu and the high-land *mukims* of Selinsing, Semanggol and Briah have experienced serious shortage; unless good falls in the catchment area are experienced shortly some nurseries will have to be resown. Rat damage also becomes imminent and most serious of all it is to be feared that

cultivators will tend to revert to late planting with the risk of flood damage in September/October. A slight outbreak of rice case-worm was reported from Krian. In the *mukims* of Ijok in Perak North nurseries sown in early June (the scheduled time) have had to be resown.

In Perak South planting is well forward in and around Tanjong Malim and Bidor, but little interest is being taken in the Batang Padang and Chenderiang *mukims*. Clearing and planting of nurseries is progressing in Kinta and in the down-river *mukims* of Lower Perak.

The position in the Sungei Manik area is not very satisfactory. Clearing was late and it is becoming evident that satisfactory water supply has not yet been accomplished. It appears that planting this season will be dependent upon rainfall.

In Pahang there was a shortage of water but no serious damage was reported.

Work was reported to be rather behindhand in the coastal *mukims* of Malacca. Arrangements have been made for the sale of Perlis phosphate by local dealers to cultivators. This fertilizer is cheap in comparison with ground bones which have been employed in the past.

There has been considerable delay in Johore due to shortage of water. It is reported that a considerable area of padi land in the Tangkak District has been abandoned; on the other hand, there will probably be an increase in the planted area in Johore Central. Some damage was done by leaf-eating insects and stem-borers in parts of Segamat District.

Copra.—There was a general further decline of prices during the month with slight recovery at the end. In Perak North certain dealers who were not in close touch with the Penang market lost heavily by paying too high prices to producers. Copra manufacture in Perak South Circle continues. The posting of daily Penang quotations at Police Stations and *balais* in this Circle has given rise to favourable comment from small producers. There has been a certain amount of planting of new areas by small-holders in Negri Sembilan in the Seremban and Tampin Districts, and in the Lipis District of Pahang. In Pahang East improved kilns in Kuala Pahang and Pulau Teoman continue to produce good quality copra. A new kiln has been started at Meserah and had a successful initial run. The majority of Chinese growers in Pahang East prefer to continue manufacture of low-grade copra. In Malacca the survey of copra production in coastal *mukims* was commenced. In Johore a number of new kilns has been erected in Batu Pahat District; the majority are of the plank wall type, but a few are of the most primitive description.

Pineapples.—One thousand three hundred piculs of fresh pines were exported to Selangor from Negri Sembilan. In Singapore and Johore prices both for fresh and canned pines advanced. The Johore factories worked short

time on reduced quantities of inferior material. A type plan of desirable factory lay-out was produced in Singapore during the month and considerable interest was shown in this plan by the industry.

Fruit.—In Perak there was a light second crop of durians, but as usual, these were of poor quality. In Malacca, Negri Sembilan and in Kelantan there was an excellent fruit harvest. In other States the fruit season showed signs of drawing to a close.

Tobacco.—Further additions to the area in the hands of Chinese in the Sungei Siput and Bruas districts took place. In Perak South large supplies came on the market with the result that prices sagged; quality was mediocre. There was some damage due to stem-borers in Negri Sembilan.

Miscellaneous.—Harvesting and preparation of gambier is in progress on small areas in Perak South; the daily out-turn is about one picul.

There has been some extension of fish culture in the Perak Central Circle along the Cameron Highlands Road. Eleven ponds are now stocked with carp. A proposal by the Fisheries Department to start fish-rearing in Pahang is under consideration.

The arecanut industry is steadily improving in Pahang East. Supplies of arecanuts in the Batu Pahat District of Johore are short and the preparation of *pinang rebus* from green under-ripe nuts is in progress.

In Johore, tapioca factories are experiencing considerable difficulties in maintaining supplies. Owners are anxious to cultivate the crop but will only do so on land at present under virgin jungle. It is not the policy of the Johore Government to permit virgin land to be used for this purpose.

Agricultural Stations and Test Plots.

Work on the Experiment Station in Krian has been delayed on account of water shortage. Kuala Kangsar Station is showing the effect of dry weather. Rapid progress is being made for the opening up of the Raub Agricultural Station. Work continued at the Pulau Gadong Station at Malacca to investigate the possibilities of mechanical cultivation for padi on large areas. It appears that two ploughings and two harrowings effected better water control than one ploughing and three harrowings.

There was a good pineapple harvest at the Pineapple Experiment Station, Singapore; the yield from closely-planted blocks was very satisfactory and compared favourably with blocks planted by the usual single row method. Examination of all fruit harvested indicated the possibility that there were two distinct strains or types of the Singapore canning pine, one being more suitable for the preparation of "Golden" quality than the other.

Progress was made with the opening of a vegetable and food crop area at the Agricultural Station, Labuan.

Agricultural Shows.

Local padi shows were held for the Larut and Matang and Selama Sub-Districts at Taiping. Local shows were also held at Tanjong Piandang, Jalan Bahru, Bagan Serai and Sungei Kapar for Perak North and at Batu Gajah and Sungkai for Perak South. Considerable interest was aroused at all these shows. Much of the padi showed evidence of under-ripening, a reflection of shortage of labour during harvesting. It emerged that improved strains distributed by the Department of Agriculture were grown in a reasonably pure state in north-west Krian and around Titi Serong, but that there was much room for improvement in this respect in central and south Krian. The entry at Bagan Serai was disappointingly poor and it is hoped that the establishment of the Departmental padi display at Bagan Serai will help to remedy this deficiency. There was a strong demand for *mukim* shows for 1936.

The Perak State Show was held in Taiping on the 25th of July. His Highness the Sultan took great interest in the show and presented the winner of the first prize with a gold watch as a personal gift.

In Pahang the combined agricultural show, padi competition and smallholders' rubber competition was held at Bentong on the 21st of July. The show was attended by His Highness the Sultan. There was a considerable improvement in the number and quality of exhibits which totalled 1943 as against 1073 last year. The padi generally was of good quality.

In Johore a successful show was held at Mersing on the 4th July where the agricultural exhibits exceeded anticipation in quantity and the majority were of very good quality. An Agricultural Show held at Muar on the 11th and 12th was attended by Their Highnesses the Sultan and Sultanah. This show was an outstanding success and the exhibits of rubber sheet, in particular, must be singled out for mention as being of exceedingly high standard.

District Agricultural and Padi Shows were held in Ulu Langat, Kuala Langat and Sabak, Selangor, while a padi competition only was held in Kuala Selangor. The padi exhibits at Ulu Langat and Kuala Selangor were poor. The Kuala Langat show was opened by H.H. the Sultan of Selangor.

DEPARTMENTAL NOTES.

H. E. The Governor and High Commissioner visits the Department.

His Excellency the Governor, Straits Settlements, and High Commissioner, Malay States, (Sir Shenton Thomas, K.C.M.G., O.B.E.) visited the headquarters and laboratories of the Department of Agriculture at Kuala Lumpur on 1st August, 1935.

Visits of the Adviser on Agriculture.

The acting Adviser on Agriculture (Mr. F. W. South) visited the Agricultural Show held at Muar, Johore, on 11th July and paid a visit of inspection to the Agricultural Station and new Padi Test Plot at Kuala Pilah, Negri Sembilan, on the 12th.

On 21st, Mr. South visited the Bentong (Pahang) Agricultural Show where he judged the exhibits in one Section. He visited Taiping (Perak) on 25th where he attended and judged in the State Padi Competition.

During these visits he took the opportunity of discussing a number of subjects with State Agricultural Officers.

Meeting of Agricultural Advisory Committee.

A meeting of the Agricultural Advisory Committee was held at the Department of Agriculture, Kuala Lumpur, on 10th July 1935.

Manufacture of Rubber Smoked Sheet on Small Holdings.

The Asiatic Rubber Instructors have been actively engaged in instructional and propaganda work, especially in connexion with the preparation of good quality smoked sheet. In their work they have been assisted by the propaganda work performed through the Lecture Caravan, and by demonstrations of a cheap smoke-house at agricultural shows.

As a further aid in their work the Department has recently published in Malay and Chinese a leaflet which deals with the coagulation, machining, drying and packing of rubber, while another leaflet will shortly be issued which describes the construction of an efficient smoke house which can be made for a cost of about $5.

Leave.

Mr. R. G. H. Wilshaw, Assistant Chemist, (Rice Research), returned from leave on 18th July 1935.

Mr. B. A. Lowe, Assistant Botanist, (Rice Research), returned from leave on 1st August, 1935.

Statistical.

MARKET PRICES.

July, 1935.

Rubber.—The price of rubber weakened in July, remaining below 20 cents per lb. almost throughout the month. Spot loose opened at 20 3/16 cents per lb. and closed at 19⅜ cents. The Singapore average price for No. 1.X. Rubber Smoked Sheet was 19.58 cents per lb. as compared with 20.35 cents per lb. in June. The average price in London for the month was 5.84 pence per lb., and in New York 12.04 cents gold per lb., as compared with 6.04 pence and 12.47 cents gold in June.

Prices paid for small-holders' rubber at three centres during the month are shewn in the following table.

Table I.
Weekly Prices Paid By Local Dealers for Small-Holders' Rubber, July, 1935.

(Dollars per Picul.)

Grades.	Kuala Pilah, Negri Sembilan.				Kuala Kangsar, Perak.				Batu Pahat, Johore.			
	4	11	18	25	3	10	17	24	3	10	17	24
Smoked sheet	24.86	24.00	24.68	23.50	23.50	23.56						23.00
Unsmoked sheet	23.00	22.86	23.00	22.31	23 00	22.16	22.00	22.00	22.00	22.00	21.70	21.85
Scrap	17.00	17.00	17.50								17.80	

Transport by F. M. S. R. lorry service Kuala Pilah to Seremban 12 cents per picul, to Malacca excluding duty, 25 cents per picul, by rail Seremban to Penang $1.24 per picul, Seremban to Singapore $8.00 per ton.

Transport from Batu Pahat to Singapore by lorry excluding duty, 90 cents per picul.

Transport from Kuala Kangsar to Prai by railway $6.20 per ton.

Transport from Kuala Kangsar to Singapore by railway $10.00 per ton (minimum consign ment 5 tons).

At Kuala Pilah the standard deduction for moisture in unsmoked sheet is 5 per cent.

At Kuala Kangsar the standard deduction for moisture in unsmoked sheet is 10 per cent

Palm Oil.—The market weakened further during July and the following table gives quotations for the Malayan commodities.

Table II.

Prices of Palm Oil and Palm Kernels.

Date 1935.	Palm Oil in Bulk, c i.f. landed weight Liverpool/ Halifax. per ton	Palm Kernels, c.i.f. landed weight London/ Continent per ton
July 4	18. 0. 0	8. 0. 0
,, 12	17. 0. 0	7. 15. 0
,, 19	17. 0. 0	7. 15. 0
,, 26	18. 0. 0	7. 10. 0

Copra.—Prices in Singapore weakened still further during July but improved steadily during the second half of the month. The sun-dried grade opened at $4.00 per picul, fell to $3.70 on the 13th July, and thereafter rose to close at $4 per picul. The average price for the month was $3.87 per picul as compared with $4.40 in June. The mixed quality failed to improve to the same extent as the better grade and averaged $3.48 as compared with $4.05 in June.

Copra cake remained unchanged throughout the month at $1.50 per picul.

Rice.—The average wholesale prices of rice per picul in Singapore for June were as follows:—Siam No. 2 (ordinary) $4.34, Rangoon No. 1 $3.72, Saigon No. 1 $3.87, as compared with $4.77, $3.77 and $4.05 in May. Corresponding prices in June 1934 were $2.66, $2.50 and $2.60.

The average retail market prices in cents per gantang of No. 2 Siam rice in June were:—Singapore 32, Penang 23, Malacca 30, as compared with 32, 20, and 30 respectively in May.

The average declared trade value of imports of rice in June was $3.80 per picul, as compared with $3.97 in May, and $3.62 in April.

Padi.—The privately owned mill at Parit Buntar paid $2 per picul during July. Prices per gantang ranged from 5 to 13 cents in different parts of the country.

Tea.—Several consignments of Malayan tea were sold on the London market during July. Highland tea averaged 11½d. per lb., and consignments of lowland tea from two different estates averaged 10¼d. and 11¾d. respectively.

Average London prices per lb. paid during July for tea consignments from other countries were as follows:—Ceylon 1s. 1.44d., Java 10.09d., Indian Northern 11.55d., Indian Southern 11.79d., Sumatra 9.08d.

The latest Colombo average prices available quoted from the *Weekly Tea Market Report,* 30th July, 1935, of the Colombo Brokers' Assocation are as follows:—(prices are in rupee cents per lb.) High Grown Teas 78 cents, Medium Grown Teas 65 cents, Low Grown Teas 56 cents. Straits Tea (Jugra Land) was quoted on the 23rd July at 47 cents.

Tuba Root (Derris).—The Singapore market for tuba remains practically unchanged. Supplies of roots sold on a basis of rotenone content are still scarce, and the price continues at $53 per picul. Roots sold on a basis of ether extract fell to $40 per picul from $42, and non-Malayan roots continued at $32 per picul.

Coffee.—Prices in Singapore declined during July. Sourabaya coffee fell from $14.50 to $15.00 to $13 to $14 per picul, and Palembang coffee averaged $9.31 per picul as compared with $11.19 in June.

Local prices for coffee ranged from $12 to $28 per picul, depending upon quality.

Arecanuts.—The market improved considerably during July, and Singapore average prices per picul were:—Splits $4.81 to $7.44, Sliced $9.38 to $10.75, Red Whole $6.31 to $7.19, Kelantan $6.81 to $7.18, the price in each range depending upon quality.

The average prices per picul quoted by the Singapore Chamber of Commerce were:—Best $7.31, Medium $6.85, Mixed $6.18.

Gambier.—Block continued unchanged at $6 per picul, and No. 1 Cube improved in price slightly to $10.50, averaging $10.62 per picul as compared with $10.20 in June.

Pineapples.—The Packers' Combine in Singapore continue to fix prices for the canned fruit. In July they advanced prices per case to: Cubes, $3.45, Sliced Flat $3.25, Sliced Tall $3.60 as compared with $3.35, $3.15 and $3.40 respectively in June.

Fresh fruit prices per 100 were:—Singapore $3.60 and $3.20 for large and small sizes respectively; Johore 1st quality $2.80 to $3.50, 2nd quality $2 to $3.10, 3rd quality $1 to $2.80.

Tapioca.—The market is stagnant and prices remained unchanged in July; they were:—Flake Fair $4 per picul, Seed Pearl $5.40, Medium Pearl $6.

Sago.—Pearl, Small Fair, continued unchanged at the June closing price of $3.75 per picul, as compared with an average of $3.85 in June. Flour, Sarawak Fair improved slightly to average $2.27 per picul as against $2.26 in June.

Mace. Siouw maintained its price, averaging $76.25 per picul as compared with $80.20 in June. Amboina fell still further, the average for the month being $58.25 as compared with $60.40 in the previous month.

Nutmegs.—110's were quoted throughout the month at $28 per picul, but 80's weakened slightly to average $31 per picul as compared with $31.40 in June.

Pepper.—A slight interest was shewn in the pepper market during July, but prices continued to weaken. Singapore average prices per picul were :— Singapore Black $10.25, Singapore White $16.75, Muntok White $17.75 as compared with $11.40, $19.60, and $20.60 respectively in June.

Cloves.—Nominal quotations in Singapore for both Zanzibar and Amboina were $35 per picul.

Cardamoms.—Prices of cardamoms, green, were quoted in Ceylon Chamber of Commerce weekly reports for July ranging from 85 rupee cents to R.1.05 per lb. to 93 cents to R.1.03 per lb.

Tobacco.—Prices ranged from $16 to $50 per picul according to quality. In Perak, prices were reported to be : 1st quality $60, 2nd quality $30 to $40, 3rd quality $25 to $30.

The above prices are based on London and Singapore daily quotations for rubber; on the Singapore Chamber of Commerce Weekly Reports for the month and on other local sources of information. Palm oil reports are kindly supplied by Messrs. Guthrie & Co. Ltd., Kuala Lumpur; the Singapore prices for coffee and arecanuts by the Lianqui Trading Company of Singapore, and tuba prices by Messrs. Mackay & Co., Singapore.

1 picul = 133⅓ lbs. The Dollar is fixed at two shillings and four pence.

Note.—The Department of Agriculture will be pleased to assist planters in finding a market for agricultural produce. Similar assistance is also offered by the Malayan Information Agency, 57, Charing Cross, London, S.W.1.

GENERAL RICE SUMMARY.*

June, 1935.

Malaya.—Imports of foreign rice in June were 48,621 tons and exports 13,673 tons, net imports being 34,948 tons. Net imports for the first half year 1935 totalled 221,322 tons as compared with 221,292 tons in 1934.†

Of the June imports, 56 per cent. were consigned to Singapore, 15 per cent. to Penang, 6 per cent. to Malacca, 18 per cent. to the Federated Malay States and 5 per cent. to the Unfederated Malay States. Of the total, 58 per cent. came from Siam, 34 per cent. from Burma, 7 per cent. from French Indo-China and 1 per cent. from other countries.

Of the exports during June, 75 per cent. were consigned to the Netherlands Indies, and 27 per cent. to other countries. The various kinds of rice exported were as follows:—Siam 9,028 tons (66.1 per cent.), Burma 3,776 tons (27.6 per cent.), French Indo-China 585 tons (4.3 per cent.), parboiled 144 tons (1.1 per cent.), local production 130 tons (0.9 per cent.).

India and Burma.—Foreign exports for the period January to May 1935 inclusive were 1,023,000 tons, as compared with 814,000 tons in 1934, an increase of 25.7 per cent. Of these exports, 4.7 per cent. were to the United Kingdom, 12.2 per cent. to the Continent, 19.2 per cent. to Ceylon, 32.9 per cent. to the Straits Settlements and the Far East, and 31 per cent. to other countries. The 1934 percentages were 11.7, 21.4, 20.2, 17.9 and 28.8.

Burma's total exports of rice and bran (*Bangkok Times* 1st July 1935) for the first five months of 1935 aggregated 1,894,623 metric tons, as compared with 2,000,439 metric tons in 1934, a decrease of 5.3 per cent. as compared with 1934.

Siam.—The exports of rice and rice products from Bangkok in May are provisionally stated to be 116,894 tons. Exports for the first five months of 1935 were 705,526 tons, as compared with 740,179 tons in 1934.

Japan.—Stocks of rice in Japan Proper on 1st June (*Trans-Pacific Journal* 27th June 1935) amounted to 4,486,727 tons of which Japanese rice totalled 4,285,777 tons, Korean rice 172,254 tons, Formosan rice 27,384 tons and foreign rice 1,312 tons, according to the Agriculture Ministry. Stocks on 31st October are expected to be about 1,542,777 tons, of which the Government-owned rice will total 1,292,707 tons.

Formosa.—According to a report dated 12th July 1935, on the first estimate of the first Formosan rice crop, the area planted amounted to 733,123 acres, an increase of 20,518 acres, or 2.9 per cent. as compared with the planted area for the same crop in 1934. Production is estimated to amount to 620,841 tons, a decrease of 1.9 per cent. as compared with the actual

* Abridged from the Rice Summary for June 1935, compiled by the Department of Statistics, Straits Settlements and Federated Malay States.

† It is to be understood throughout the summary that all comparisons and percentage increases or decreases are in relation to the corresponding period of 1934.

production of the same crop for the previous year. The decrease is attributed to the outbreak of disease caused by the unfavourable weather conditions that prevailed from the middle of March to the end of May.

French Indo-China.—Entries of padi into Cholon during the period January to end of June 1935 amounted to 1,102,656 metric tons, as compared with 758,091 metric tons in 1934, or an increase of 45.5 per cent. Exports of rice for the same period increased by 46.6 per cent., being 1,177,257 metric tons in 1935 as compared with 803,067 metric tons in 1934.

The Netherlands Indies.—The total area under padi harvested during the first four months of 1935 was 2,991,170 acres, as compared with 2,988,700 acres for the same period of 1934, an increase of 0.1 per cent.

According to *The Netherlands Indies* of 1st July 1935, issued by the Department of Economic Affairs, the imports of rice into the Netherlands Indies during the first four months of 1935 amounted to 195,100 metric tons, as compared with 56,900 metric tons over the corresponding period of 1934, an increase of 242.9 per cent.

Ceylon.—Imports for the period January to June 1935, totalled 254,073 tons, as compared with 243,009 tons in 1934, an increase of 4.6 per cent. Of the 1935 imports, 11.7 per cent. were from British India, 71.0 per cent. from Burma, 1.3 per cent. from the Straits Settlements, and 16.0 per cent. from other countries. The corresponding 1934 percentages were 14.4, 65.1, nil, and 20.5.

Europe and America.—Shipments to Europe from the East for the period 1st January to 20th June 1935 totalled 502,085 tons, a decrease of 27.8 per cent. as compared with the 1934 shipments of 695,539 tons. Of the 1935 shipments, 57.1 per cent. were from Burma, 1.5 per cent. from Japan, 33.8 per cent. from Saigon, 5.5 per cent. from Siam and 2.1 per cent. from Bengal. The 1934 percentages were 44.4, 3.4, 39.8, 9.4, and 3.0 respectively.

Shipments for the Levant from the East for the period 1st January to 25th May 1935 were 21,678 tons, an increase of 2,798 tons (14.8 per cent.) over 1934.

Shipments for Cuba, West Indies, and America from 1st January to 1st June 1935 were 116,790 tons; as compared with 81,888 tons in 1934—an increase of 42.6 per cent.

MALAYAN AGRICULTURAL EXPORTS, JUNE, 1935.

PRODUCT.	Net Export in Tons.				
	Year 1934.	Jan-June 1934	Jan-June 1935	June 1934	June 1935
Arecanuts ...	27,336	17,250	12,367	1,999	2,257
Coconuts, fresh † ...	100,804†	45,695†	48,630†	7,960†	9,537†
Coconut oil ...	25,485	12,583	14,808	1,833	2,304
Copra ...	95,599	44,827	51,483	6,475	8,669
Gambier, all kinds ...	2,170	1,042	1,306	132	167
Oil cakes ...	11,273	6,191	3,593	1,220	347
Palm kernels ...	3,196	1,345	1,602	203	221
Palm oil ...	15,852	6,229	9,590	1,279	913
Pineapples canned ...	66,634	39,557	39,089	10,043	9,805
Rubber ¶ ...	479,371¶	235,446¶	192,705¶	24,203¶	28,307¶
Sago,—flour ...	10,403	4,246	5,355	115	577
„ —pearl ...	5,058	2,123	2,296	348	459
„ —raw ...	7,079*	2,899*	3,615*	499*	849*
Tapioca,—flake ...	5,761	4,114	981	529	133
„ —flour ...	1,842*	1,238*	498*	340*	37*
„ —pearl ...	15,770	7,941	7,919	1,199	1,366
Tuba root ...	481	297	312½	38	56

† hundreds in number. * net imports. ¶ production.

MALAYAN PRODUCTION IN TONS OF PALM OIL AND KERNELS

(As declared by Estates)

Period.	Palm Oil		Palm Kernels	
	F.M.S.	U.M.S.	F.M.S.	U.M.S.
January 1935 ...	1,062.3	339.3	174.0	49.6
February „ ...	977.4	220.9	161.7	38.5
March „ ...	1,104.3	334.2	172.6	48.6
April „ ...	1,008.2	328.0	151.2	40.4
May „ ...	1,077.1	461.8	158.6	63.1
June „ ...	1,311.0	724.1	200.9	105.5
Total ...	6,540.3	2,408.3	1,019.0	345.7
Total Jan. to June, 1934 ...	5,204.5	1,811.3	907.7	352.0
Total at end of 1934 ...	12,965.0	4,510.0	2,013.0	795.0

ACREAGES OF TAPPABLE RUBBER NOT TAPPED ON ESTATES OF 100 ACRES AND OVER, FOR THE MONTH ENDING 30TH JUNE, 1935.

STATE OR TERRITORY	Acreage of Tappable Rubber end 1934	ESTATES WHICH HAVE ENTIRELY CEASED TAPPING		ESTATES WHICH HAVE PARTLY CEASED TAPPING (*a*)		AREA OF TAPPABLE RUBBER NEVER BEEN TAPPED		Total (3) + (5)	Percentage of (9) to (2)
		Acreage	Percentage of (3) to (2)	Acreage	Percentage of (5) to (2)	Acreage	Percentage of (7) to (2)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
STRAITS SETTLEMENTS :—									
Province Wellesley	44,691	344	.8	12,635	28.2	757	1.7	12,979	29.0
Malacca	123,793	355	.3	22,036	17.8	3,272	2.6	22,391	18.1
Penang Island	2,593	198	7.6	246	9.5	163	6.3	444	17.1
Singapore Island	33,312	4,148	12.5	7,430	22.3	809	2.4	11,578	34.8
Total S.S. ...	204,389	5,045	2.5	42,347	20.7	5,001	2.4	47,392	23.2
FEDERATED MALAY STATES :—									
Perak	295,895	5,929	2.0	46,526	15.7	13,511	4.6	52,455	17.7
Selangor	345,100	10,805	3.1	45,715	13.2	13,479	3.9	56,520	16.3
Negri Sembilan	258,381	10,507	4.1	38,504	14.9	16,269	6.3	49,011	19.0
Pahang	75,912	8,415	11.1	20,702	27.3	14,822	19.5	29,117	38.4
Total F.M.S. ...	975,288	35,656	3.7	151,447	15.5	58,081	6.0	187,103	19.2
UNFEDERATED MALAY STATES :—									
Johore	417,633	12,836	3.1	38,587	9.2	26,867	6.4	51,423	12.3
Kedah (*b*)	199,180	3,880	1.9	22,423	11.3	19,349	9.7	26,303	13.2
Kelantan	28,891	403	1.4	7,848	27.2	5,622	19.5	8,251	28.6
Trengganu (*b*)	4,643	Nil	Nil	15	0.3	5	.1	15	.3
Perlis (*c*)	1,206	Nil	Nil	505	41.9	25	2.1	505	41.9
Brunei	(*d*) 4,991	Nil	Nil	1,498	30.0	878	17.6	1,498	30.0
Total U.M.S. ...	656,544	17,119	2.6	70,876	10.8	52,746	8.0	87,995	13.4
TOTAL MALAYA ...	1,836,221	57,820	3.1	264,670	14.4	115,828	6.3	322,490	17.5

Notes :—(*a*) Area out of tapping on Estates which have partly ceased tapping refers to areas definitely being rested and excludes areas on any tapping round.
(*b*) Registered Companies only.
(*c*) Rendered quarterly.
(*d*) Acreage of tappable rubber on 1st May, 1934.

MALAYA RUBBER STATISTICS — TABLE I

STOCKS, PRODUCTION, IMPORTS AND EXPORTS OF RUBBER, INCLUDING LATEX, CONCENTRATED LATEX AND REVERTEX, FOR THE MONTH OF JUNE, 1935 IN DRY TONS.

State or Territory 1	Stocks at beginning of month 1			Production by Estates of 100 acres and over		Production by Estates of less than 100 acres estimated 2		Imports				Exports including re-exports				Stocks at end of month			Consumption 3	
								during the month		Jan. to June inclusive 1935		during the month		Jan. to June inclusive 1935						
	Ports	Dealer	Estates of 100 acres and over	during the month	January to June inclusive 1935	during the month	January to June inclusive 1935	Foreign	From Malay States & Labuan	Foreign	From Malay States & Labuan	Foreign	Local	Foreign	Local	Ports	Dealers	Estates of 100 acres and over	during the month	January to June inclusive 1935
MALAY STATES :—	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Federated Malay States ...	...	10,264	10,585	11,573	67,889	2,655	34,110	Nil	Nil	17	Nil	*13,341 †10,444	†2,814	*13,341 87,096	20,336	...	9,571	12,237	11	55
Johore ...	...	1,949	3,829	4,347	23,967	2,283	20,239	Nil	12	Nil	105	2,312	3,699	14,583	27,534	...	2,037	4,372	...	...
Kedah ...	...	265	2,267	2,564	15,104	762	5,583	Nil	Nil	Nil	Nil	1,700	1,550	9,130	10,717	...	276	2,332	...	...
Perlis ...	...	18	19	4	69	16	89	Nil	Nil	Nil	Nil	Nil	23	Nil	163	...	9	25	...	...
Kelantan ...	...	363	225	339	1,886	265	2,627	Nil	Nil	Nil	Nil	255	423	882	3,451	...	193	321	...	...
Trengganu ...	...	55	50	315	1,452	157	726	Nil	Nil	Nil	Nil	Nil	472	Nil	2,178	...	55	50	...	...
Brunei ...	...	12	32	47	285	60	350	...	...	...	...	...	111	...	621	...	5	35	...	...
Total Malay States	...	12,926	17,007	19,189	110,652	6,198	63,724	Nil	12	17	105	17,608	9,092	111,691	65,000	...	12,146	19,372	11	55
S. SETTLEMENTS :-																				
Malacca ...	...	2,777	1,300	1,243	7,873	535	3,827	Nil		Nil		2,220		16,813		...	2,405	1,438	...	...
Province Wellesley ...	...	1,899	400	481	2,930	249	1,294	Nil		Nil		7,480		43,175		...	1,951	563	...	...
Penang ...	3,988	10,154	11	16	96	110	501	2,607	9,072	14,300	66,236		Nil		Nil	2,245	8,547	12	...	...
Singapore ...	5,127	35,471	252	174	1,131	95	597	15,956		89,756		22,443		137,302		5,659	35,319	292	46	241
Labuan	...	33	Nil	Nil	Nil	17	80	74		568		Nil		Nil		...	30	Nil	...	...
Total Straits Settlements	9,115	50,334	1,963	1,914	12,030	1,006	6,299	18,637	9,072	104,624	66,236	32,143	Nil	197,290	Nil	7,904	48,252	2,305	46	241
TOTAL MALAYA	9,115	63,260	18,970	21,103	122,682	7,204	70,023	18,637	9,084	104,641	66,341	49,751	9,092	308,981	65,000	7,904	60,398	21,677	57	296

* Ocean shipments from Malaya of rubber directly consigned from the F.M.S. † Exports of rubber from the F.M.S. during June, 1935.

TABLE II
DEALERS' STOCKS, IN DRY TONS 3

Class of Rubber 22	Federated Malay States 23	S'pore 24	Penang 25	Province Wesly D'dings M'cca. 26	Johore 27	Kedah 28
DRY RUBBER	8,673	31,071	7,353	4,159	1,572	158
WET RUBBER	898	4,248	1,194	232	465	118
TOTAL ...	9,571	35,319	8,547	4,391	2,037	276

TABLE III
FOREIGN EXPORTS

PORTS 29	For month 30	January to June 1935 31
Singapore ...	31,501	205,788
Penang ...	12,191	68,578
Port Swettenham.	5,604	32,491
Malacca ...	455	2,124
MALAYA ...	49,751	308,981

TABLE IV
DOMESTIC EXPORTS 4

AREA 32	For month 33	January to June 1935 34
Malay States ...	23,775	164,744
Straits Settlements	2,618	16,820
MALAYA ...	26,393	181,564

Notes :—

1. Stocks on estates of less than 100 acres and stocks in transit on rail, road or local steamer are not ascertained.
2. The production of estates of less than 100 acres is estimated from the formula : Production + Imports + Stocks at beginning of month = Exports + Stocks at end of month, + Consumption, *i.e.*, Column [9] = Columns [15] + [16] + [19] + [20] + [21] + [22] − [4] − [5] − [6] − [7] − [11] − [12]. For the Straits Settlements the production of estates of less than 100 acres is represented by sales or exports as shown by cess paid.
3. Dealers' stocks in the Federated Malay States are reduced to dry weights by the following fixed ratios: unsmoked sheet, 15% wet sheet, 25% scrap, lump, etc., 40%; stocks elsewhere are in dry weights as reported by the dealers themselves.
4. Column (33) and (34) represent exports of rubber subject to regulation which, for Singapore and Penang Islands are represented by sales or exports as shown by cess paid.
5. The above, with certain omissions, is the Report published by the Registrar-General of Statistics, S.S. and F.M.S., at Singapore on 24 July, 1935.

METEOROLOGICAL SUMMARY, MALAYA, JUNE, 1935.

Locality.	Air Temperature in degrees Fahrenheit							Earth Temperature		Rainfall								Bright Sunshine.		
	Means of			Absolute Extremes						Total.		Most in a day.	Number of days.					Total.	Daily Mean.	Per cent.
	A. Max.	B. Min.	Mean of A and B.	Highest Max.	Lowest Min.	Lowest Max.	Highest Min.	At 1 foot	At 4 feet			Amt.	Precipitation .01 in or more	Precipitation, .04 in or more	Thunder-storm	Fog morning obs.	Gale force 8 or more			
	°F	°F	°F	°F	°F	°F	°F	°F	°F	in.	mm.	in.						Hrs.	Hrs.	
Railway Hill, Kuala Lumpur, Selangor ...	89.7	71.9	80.8	92	70	85	74	84.4	85.3	7.52	191.0	1.80	14	12	4	2		181.15	6.04	49
Bukit Jeram, Selangor ...	88.0	72.8	80.4	92	71	85	74	83.5	85.8	6.53	165.9	2.63	13	11	2			223.00	7.43	60
Sitiawan, Perak ...	89.5	72.6	81.1	92	70	86	74	83.3	84.7	3.38	85.9	0.61	13	12		1		224.95	7.50	61
Temerloh, Pahang ...	89.1	72.5	80.8	92	70	83	74	84.9	86.4	7.94	201.7	2.58	15	13	6	10		175.60	5.85	47
Kuala Lipis, Pahang ...	88.5	71.4	79.9	91	69	85	73	84.0	84.8	6.33	160.8	1.42	20	15		28		175.85	5.86	48
Kuala Pahang, Pahang ...	85.8	73.9	79.9	89	73	79	76	85.1	86.1	4.77	121.2	1.55	11	10			1	200.55	6.69	54
Kallang Aerodrome, S'pore ...	85.3	76.2	80.7	88	73	81	81	81.4	82.9	7.84	199.1	1.98	15	14	2			158.75	5.29	43
Butterworth, Province Wellesley ...	87.4	73.8	80.6	90	71	83	77	85.4	86.0	7.59	192.8	2.37	19	15				226.50	7.55	61
Bayan Lepas Aerodrome, Penang ...	86.9	73.6	80.3	90	70	82	77	84.9	85.7	12.17	309.1	2.74	20	18				210.90	7.03	57
Bukit China, Malacca ...	84.0	73.5	78.7	89	70	78	75	82.6	83.9	10.92	277.4	2.17	18	15	3			174.95	5.83	47
Kluang, Johore ...	86.9	71.2	79.1	91	69	81	73	81.6	82.5	7.75	196.9	1.74	18	15	5	17		146.50	4.88	40
Bukit Lalang, Mersing, Johore	85.6	72.1	78.9	90	70	77	74	82.1	82.5	10.92	277.4	2.61	17	15	7	1		169.95	5.67	46
Alor Star, Kedah ...	87.3	74.4	80.9	92	72	81	77	87.0	86.7	6.73	170.9	0.93	21	18	2			218.80	7.29	58
Kota Bahru, Kelantan ...	90.1	74.0	82.1	93	72	86	77	85.2	85.4	5.13	130.3	2.01	11	9				251.50	8.38	68
Kuala Trengganu, Trengganu	89.4	72.9	81.1	92	71	86	75	84.2	85.2	2.92	74.2	1.26	7	6	2	1	1	229.50	7.65	62
HILL STATION.																				
Fraser's Hill, Pahang 4268 ft.	74.1	62.8	68.5	78	60	70	64	71.8	72.6	5.69	144.5	1.88	19	14	5	6		162.85	5.43	44
Cameron Highlands, Tanah Rata, Pahang 4750 ft. ...	72.9	56.7	64.8	76	51	68	61	70.6	70.4	9.17	232.9	1.63	21	19	1		1	148.20	4.94	40
Cameron Highlands, Rhododendron Hill, Pahang 5120 ft. ...	71.8	59.3	65.5	77	57	66	60			9.29	236.0	1.42	21	18	1		1	158.30	5.28	43

Compiled from Returns supplied by the Meteorological Branch, Malaya